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ABSTRACT

The study's objectives were to: (1) determine the criteria used by industry in the selection of an area as a plant site; (2) measure the interdependence and economic impact that a manufacturing sector has on an agriculturally dominated rural area; and (3) evaluate employees' attitudes toward their new jobs in manufacturing. Jamestown, North Dakota was chosen as the study area since it typified a rural area which was heavily dependent on agriculture, but which had been successful in attracting industry. Questionnaires were used to gather data from: (1) managers and personnel of four firms recently locating in Jamestown, (2) four other firms who had evaluated the site but did not locate there, and (3) business and civic leaders of Jamestown. Factors designated of greatest influence to site selection were community attitudes toward industry, grants and concessions made available to manufacturing firms, and labor related factors. Positive labor related factors were labor costs, willingness of local workers, a large supply of trainable labor, labor laws (right-to-work law), and labor unions. Although some dissatisfaction was expressed toward the personal time discipline required in manufacturing work, most workers expressed approval of their job role, of the higher standard of living manufacturing employment provided the majority of persons, and of the opportunity for employment afforded 81 percent of the personnel who objected to outmigration from the State. (NQ)

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# A Case Study of RURAL INDUSTRIALIZATION in Jamestown, North Dakota

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## FOREWORD

Many non-metropolitan communities of the Midwest have suffered a declining economy due to the changing structure of the agricultural industry. Such communities often seek new industry as a stimulus to their lagging economy and as an alternative to outmigration of area residents. A case study of a region successful in expanding their industrial sector was undertaken to determine the impact and acceptance of rural industrialization. It is hoped this information will provide a basis for comparison within other communities seeking new industry or encouraging expansion of one or more existing sectors.

We extend our appreciation to the managers of the manufacturing firms who were so generous with their time and cooperation. Thanks are also due the personnel of these firms and the business and civic leaders of Jamestown for the information supplied to make this study possible.

The writers gratefully acknowledge the manuscript review and valuable suggestions contributed by Dr. Fred R. Taylor, Dr. William C. Nelson, Dr. Thor A. Hertsgaard, and Rev. William C. Sherman.

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TABLE OF CONTENTS


| | Page |
|---|---|
| HIGHLIGHTS | iv |
| INTRODUCTION | 1 |
| The Trend Toward Industrial Decentralization | 3 |
| Need for the Study | 4 |
| The Study Area | 4 |
| Objectives of the Study | 7 |
| THE JAMESTOWN SURVEY OF LOCATION FACTORS | 7 |
| Procedure | 7 |
| Characteristics of Sample Firms | 8 |
| Narrowing the Selection of Sites | 8 |
| Evaluation of Jamestown Location Factors | 11 |
| SOCIAL AND ECONOMIC IMPACT OF INDUSTRIALIZATION | 14 |
| Industrial Impact at Jamestown | 15 |
| Business and Service Sector Impact | 15 |
| Impact on the Level of Employment | 16 |
| Impact on the Regional Economy | 17 |
| THE HUMAN RESOURCE | 22 |
| Adjustments to Industrial Employment | 22 |
| Industrial Employment and Loss of Liberty | 23 |
| Industrial Employment and Loss of Status | 23 |
| Industrialization and Loss of Job Security | 24 |
| Industrialization and the Young Worker | 24 |
| Industry's Outlook on the Human Resource | 25 |
| The Jamestown Survey of Manufacturing Employees | 25 |
| The Questionnaire | 25 |
| Tabulation and Method of Analysis | 25 |
| Survey Results | 26 |
| SUMMARY AND CONCLUSIONS | 32 |
| Summary | 32 |
| Location Factors | 32 |
| Economic Impact | 33 |
| Employee Characteristics and Attitudes | 34 |
| Conclusions | 35 |
| APPENDIX | 37 |

## LIST OF TABLES


| Table No. | | Page |
|---|---|---|
| 1 | LAND RESOURCE DISTRIBUTION IN STUTSMAN COUNTY, 1945-1969 | 6 |
| 2 | CHARACTERISTICS OF FOUR MANUFACTURING FIRMS LOCATING AND FOUR FIRMS WHO CONSIDERED LOCATING IN JAMESTOWN, NORTH DAKOTA (1972) | 9 |
| 3 | MANUFACTURING SITE SELECTION BY MAJOR GEOGRAPHIC REGIONS, GENERAL AREAS, SPECIFIC SITES, AND TOTAL NUMBER OF SITES CONSIDERED, 1973 | 10 |
| 4 | WEIGHTED INDEX OF LOCATION FACTORS BY FOUR FIRMS LOCATING, AND FOUR FIRMS WHO CONSIDERED LOCATING, IN JAMESTOWN, NORTH DAKOTA (1973) | 12 |
| 5 | ALLOCATION OF EXPENDITURES MADE BY FOUR MANUFACTURING FIRMS TO SECTORS WITHIN THE JAMESTOWN PLANNING REGION, 1972 | 19 |
| 6 | INTERDEPENDENCE COEFFICIENTS (MULTIPLIERS) BASED ON REGRESSION COEFFICIENTS REPRESENTING SPENDING ON MARGINAL UNITS OF INCOME WITHIN NORTH DAKOTA PLANNING REGIONS | 20 |
| 7 | ESTIMATES OF INCREASED GROSS BUSINESS VOLUME IN THE JAMESTOWN PLANNING REGION GENERATED BY LOCAL EXPENDITURES OF FOUR MANUFACTURING FIRMS, 1972 | 21 |
| 8 | PROFILE OF JAMESTOWN MANUFACTURING EMPLOYEES BY AGE DISTRIBUTION AND EDUCATION LEVEL, 1972 | 26 |
| 9 | FORMER RESIDENCE OF 36 PERSONS WHO MOVED TO ACCEPT WORK IN JAMESTOWN MANUFACTURING FIRMS, 1972 | 28 |
| 10 | PERCENTAGE OF JAMESTOWN MANUFACTURING EMPLOYEES BY FORMER OCCUPATION AND CURRENT POSITION HELD WITHIN THE FIRM, 1972 | 28 |
| 11 | CRITERIA FOR CHOICE OF MANUFACTURING WORK--AN EVALUATION BY JAMESTOWN MANUFACTURING EMPLOYEES, 1972 | 30 |
| 12 | AVERAGE ANNUAL SALARY AND ITS IMPACT ON THE STANDARD OF LIVING OF JAMESTOWN MANUFACTURING EMPLOYEES, 1972 | 30 |
| 13 | FREE TIME ALLOWED BY MANUFACTURING WORK COMPARED TO FORMER OCCUPATION--AN EVALUATION BY JAMESTOWN MANUFACTURING EMPLOYEES, 1972 | 31 |

| Table No. | | Page |
|---|---|---|
| 14 | WORK DISCIPLINE REQUIRED AND JOB POSITION RELATIVE TO EMPLOYEES' LEVEL OF SKILL AND TRAINING--AN EVALUATION BY JAMESTOWN MANUFACTURING EMPLOYEES, 1972 . . . . . | 32 |

APPENDIX TABLES

| | | |
|---|---|---|
| 1 | EVALUATION OF JAMESTOWN LOCATION FACTORS BY FOUR FIRMS LOCATING AND FOUR FIRMS WHO CONSIDERED LOCATING IN JAMESTOWN, NORTH DAKOTA, 1972 . . . . . | 38 |
| 2 | PERSONAL CHARACTERISTICS OF JAMESTOWN MANUFACTURING EMPLOYEES, 1972 . . . . . | 39 |
| 3 | EMPLOYEES' RESIDENCE, FORMER RESIDENCE, RESIDENCE PREFERENCE, AND COMMUTING PATTERNS OF JAMESTOWN MANUFACTURING EMPLOYEES, 1972 . . . . . | 40 |
| 4 | FORMER OCCUPATION, SKILLS, TRAINING, AND CURRENT POSITION OF JAMESTOWN MANUFACTURING EMPLOYEES, 1972 . . . . . | 41 |
| 5 | AVERAGE SALARY OF MANUFACTURING EMPLOYEES, OCCUPATION AND SALARY OF SPOUSE, AND INCOME TO HOUSEHOLDS OF MANUFACTURING EMPLOYEES, 1972 . . . . . | 42 |

## HIGHLIGHTS

Primary goals of this study were to determine the feasibility, costs, and benefits of incorporating a manufacturing sector into a local economy dominated by agriculture. The Jamestown Planning Region, located in east-central North Dakota, was chosen as the study area. Surveys within the region investigated the location factors considered most important to manufacturing firms when choosing a plant site, the economic impact of industrialization within the host community, and the employee acceptance of manufacturing work.

Location factors unique to the study area were evaluated through questionnaire response from four manufacturing firms that had located at Jamestown and four firms that had considered the site. Factors designated of greatest influence to site selection were community attitudes toward industry, grants and concessions made available to manufacturing firms, and labor related factors. Positive factor evaluations related to the labor resource were: labor costs, willingness of local workers, a large supply of trainable labor, labor laws (right-to-work law), and labor unions. Factors considered a negative influence were lack of subcontractors, proximity to other industry by-products, and a shortage of skilled labor.

Measures of industrial impact were determined through interviews within the business and public service sectors of Jamestown and through questionnaire response stating local expenditures made by the four manufacturing firms. Excess capacity in the business and public service sector resulted in little expansion of plant and equipment to meet the added demand for goods and services generated through industrialization.

There were indications that the nearly 400 jobs provided in manufacturing had little employment multiplier effect within the region. The following reasons were responsible for the minimal secondary impact:

1. The excess capacity in the business and public service sectors was sufficient to meet the increased demands of industrialization.

2. A number of rural and urban underemployed persons in the region experienced upward mobility in their occupations rather than there being an influx of workers to fill manufacturing positions.

3. A decline in outmigration that was experienced as a result of employment opportunities made available.

Aggregate expenditures made to sectors within the Jamestown Planning Region by the four manufacturing firms were $2,025,225 annually. Of this amount 81.3 percent was paid as wages and salaries, 5.0 percent was for purchases within the retail sector, and 5.2 percent was paid to communications sectors. The remaining 8.5 percent of expenditures were distributed among seven other sectors of the local economy. Input-output analysis was used to estimate the total increase in gross business volume that resulted from manufacturers' expenditures, plus local respending of that income. Output of this analysis showed the direct local expenditure of $2,025,225 generates an additional $2,615,472 in gross business volume through the multiplier process. Total increased business volume within the Jamestown Planning Region was $4,640,697.

Employee attributes and their attitudes toward work in manufacturing were measured through a personnel survey within the four Jamestown plants. Ninety-eight of the 389 persons employed by these firms (25.2 percent) returned questionnaires. Noteworthy characteristics revealed by the survey were the age distribution and education level of employees. Persons under 30 years old made up 63.3 percent of the sample, while only 19.4 percent were over 40 years old. Manufacturing employees showed a higher than average education level relative to workers in all local sectors.

Some dissatisfaction was expressed toward the personal time discipline required in manufacturing work. However, these objections appeared to be overshadowed by the acceptance most workers expressed for their job role, by the higher standard of living manufacturing employment provided the majority of persons, and by the opportunity for employment afforded 81 percent of the personnel who objected to outmigration from the state.

# A CASE STUDY OF RURAL INDUSTRIALIZATION IN JAMESTOWN, NORTH DAKOTA

By

Delmer L. Helgeson and Maurice J. Zink*

## INTRODUCTION

Much of rural America continues to suffer resource disequilibrium initially caused by settlement patterns and later intensified by technological change. The Great Plains settlement pattern, established by the 160-acre farm prescribed under the Homestead Act, could only have been justified in locations of much higher land use capacity.[1] The problem was further intensified when the railroad industry sold in small tracts major proportions of the 180 million acres it had been granted by the federal government to supplement construction costs.[2] Settlers discovered too late that land purported to have productive capacity similar to that of their Eastern or European origins never approached these extravagant claims.

To further compound the unworkable resource mix that was being established, institutions of similar structure and density were "transplanted" from the East. Towns, school districts, counties, and special governing bodies were only partially responsive to the services required when established and often became less so over time.

Many of the problems created during the settlement stage of the frontier have not been resolved, or in some cases have been intensified during adjustment stages that have followed. The Industrial Revolution, accompanied by the establishment of land grant colleges and the Cooperative Extension Service, accelerated the development and use of capital inputs in the farming industry. The productivity and relative price of capital inputs have supplied the incentive for continued substitution of capital for labor during the transition period.[3]

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[1]Kranezel, Carl Frederick, The Great Plains in Transition, University of Oklahoma Press, Norman, Oklahoma, 1955, pp. 175-176.

[2]Davidson, Jack R., and Howard W. Ottoson, Transportation Problems and Policies on the Trans-Missouri West, University of Nebraska Press, Lincoln, Nebraska, 1967, p. 8.

[3]Heady, Earl O., Benefits and Burdens of Rural Development, Chapter Six, The Iowa State University Press, Ames, Iowa, 1970, pp. 107-113.

Farm consolidation necessary to achieve economies of size and scale for adoption of this technology (particularly mechanization) has resulted in a decline in farm population from 50 percent of total population at the turn of the century[4] to less than 5 percent today.[5] Public policy and programs initiated during this adjustment stage (late 1800's to present) directed nearly all resources to agriculture in attempting to solve rural problems. At the turn of the century, agriculture was still the dominant sector of the rural economy; and farm population comprised a major proportion of the rural population. Agricultural policy became rural policy and the Secretary of Agriculture became the farmers', as well as rural America's, representative at the Cabinet table.[6] While this proved a workable approach in early stages when benefits were directed toward the land and capital resources, it contributed little to adjustment of resource misallocation as agriculture's relative importance in the rural economy declined. Rural people with little or no holdings of land or capital were essentially abandoned by public policy and generally left underemployed or unemployed when subjected to the dictates of the market economy.[7] This fact is reflected in two-thirds of all families being classed as poor[8] residing in rural areas at present.[9]

Recognition of resource imbalances and poverty in rural areas has resulted in a shift in public policy since 1955. The Rural Development Program, initiated under President Dwight D. Eisenhower, has been followed by similar or expanded programs under each administration to the present. In addition to these federal programs, a number of state and local community efforts have contributed to rural development.[10] Policies and programs have been directed toward one or a combination of three options: (1) increasing the productivity of existing industries, (2) increasing the mobility of excess resources (particularly labor), and (3) introducing new industry.

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[4]Smith, T. Lynn, Population Analysis, McGraw Hill Book Co., New York, 1948, p. 325.

[5]United States Bureau of the Census, Census of Agriculture, 1969, United States Government Printing Office, Washington, D.C.

[6]Daft, Lynn M., "Public Policies for Rural America: Legacies or Leading Edges?" American Journal of Agricultural Economics, American Agricultural Economics Association, May, 1971, pp. 250-251.

[7]Ibid., p. 250.

[8]"Poor" is defined by a federal interagency committee as a nonfarm household having a total money income of $2,600 for a couple and $4,000 for a family of four (1972).

[9]Tweeten, Luther, Foundations of Farm Policy, University of Nebraska Press, Lincoln, Nebraska, 1970, p. 420.

[10]Ibid., pp. 397-413.

## The Trend Toward Industrial Decentralization

Recent statistics indicate industrial decentralization is occurring. Between 1956 and 1966, total manufacturing employment increased by 1,840,000, or 11 percent. Of this increase, the seven highly industrialized Northern states gained only 37,000 manufacturing employees, or less than one-half of 1 percent. Manufacturing employment increased 465,000 (26 percent) in the West, and 1,026,000 (33 percent) in the South. From 1962 to 1966, private nonfarm employment grew 5 percent annually in nonmetropolitan counties and 4 percent annually in metropolitan counties.[11] Of the 31 billion dollars spent by manufacturing industries in 1970 for capital expenditure, over 50 percent was devoted to modern plants in rural areas.[12]

Factors contributing to this movement away from traditional industrial sites include:

1. Increasing economic and social costs as metropolitan growth becomes excessive. Factors of industrial production (labor costs at all levels, land, and capital) may be bid up due to increased competition among the various industries. As the center reaches a certain level of concentration, certain amenities may be lost and services become fewer and more costly. Congestion and clogged transportation networks interfere with the orderly movement of men and materials. Smog, pollution of all kinds, and crime beset the metropolis. Mounting evidence points to a social and psychological toll of residents subjected to the increased crowding.[13]

2. The declining importance of "local" markets. The importance of local markets is declining as the regional, national, and international markets assume more significant roles. Industry location at a specific point becomes less relevant as the industry output is marketed over broader geographic areas.

   Assistant Secretary of Agriculture Carroll Brunthover recently stated:

   > We are headed for a world economy. Despite the present tendency for the world to divide itself into trading blocks, there are forces working in a more constructive direction, and I believe the wave of the future is toward economic integration.[14]

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[11] Ibid., p. 440.

[12] Fernstrom, John R., and Ronald E. Kampe, "Rural Areas and the People-Jobs Cycle," 1971 Yearbook of Agriculture, United States Deparment of Agriculture, 1971, p. 56.

[13] Ibid., p. 55.

[14] Graham, Dillon, "USDA Official Believes World Economy is Coming," The Fargo Forum, July 30, 1972, p. A-11.

3. The large supply of trainable labor in many rural areas. Although special skills are often lacking in these workers, certain characteristics and attitudes often compensate. Most rural workers are highly individualistic, show greater initiative, and will commute long distances before accepting unemployment. Such workers tend to be more sympathetic to the problems of management and the profit motive since they are now, or were recently, closely associated with the management of a farming operation or a small rural business.[15]

4. A fully integrated national transportation and communication network.

5. Industrial location incentives provided by federal, state, regional, and local agencies.

## Need for the Study

The technological advances in the agricultural industry, in communications, and in transportation nearly insure the elimination of some small towns and hamlets. However, it is now recognized the trend poses a threat to what has formerly constituted a viable rural community. For political reasons and to minimize social costs, many communities consider introduction of new industry the optimum solution if their area lags economically.[16] Study of an area that has been successful in attracting new industry will indicate the effectiveness of resource expenditures used in developing the new sector. In addition, the research will reveal if theoretical projections of industrial impact are verified by the empirical analysis of the community. This insight will provide a basis for comparison within other communities seeking new industry or encouraging expansion of one or more existing sectors. It can also permit evaluation of the merits of industrialization as an alternative to outmigration.

## The Study Area

The general area of study includes nine east-central counties of North Dakota that make up State Planning Region Six (Figure 1).[17] The specific area of information gathering was in centrally located Stutsman County which contains the largest urban center of the region (Jamestown).[18] The county has

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[15]Fernstrom and Kampe, op. cit., p. 57.

[16]Tweeten, op. cit., p. 376.

[17]North Dakota was divided into eight planning regions to facilitate economic development and public service administration through Executive Order 49 by Governor William L. Guy, September 18, 1969.

[18]"Urban" is defined as those incorporated places having 2,500 inhabitants or more. The two urban centers within the region are Jamestown (population 15,385) and Valley City (population 7,843).

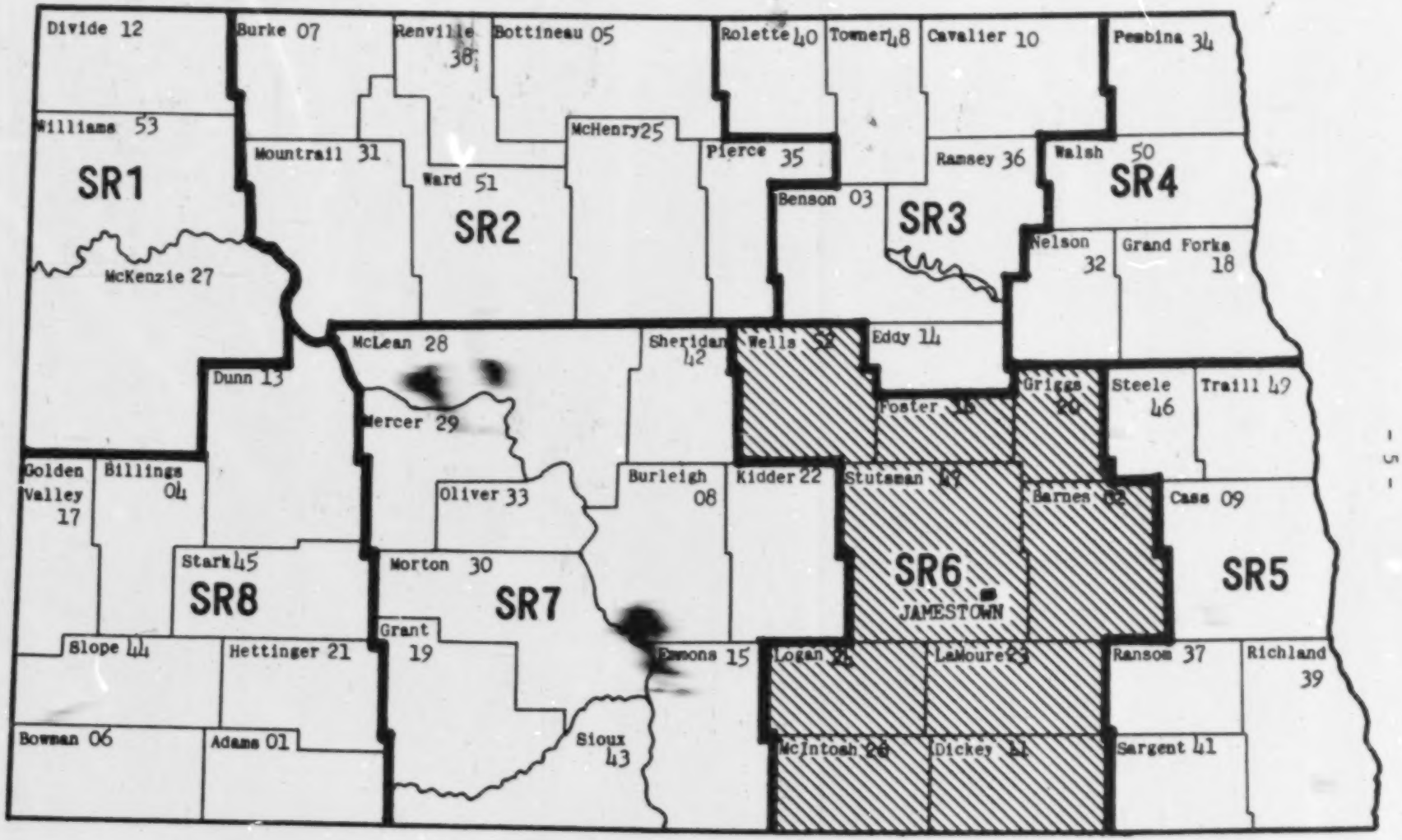


Figure 1. Eight State Planning Regions of North Dakota

nearly one and one-half million acres of land area and a population of 23,550.[19] Proven aquifers within the county provide water for municipal and industrial use. The James River offers the only other important natural resource and is used primarily for recreational purposes and wildlife habitat. Recent proposals that the river be dredged to allow barge traffic to the Gulf of Mexico await further feasibility studies and environmental considerations.

While 95 percent of the land resource is utilized for farming, a rapidly declining number of farms and farm population are reflected in the consolidation of units dictated by increased mechanization (Table 1).

TABLE 1. LAND RESOURCE DISTRIBUTION IN STUTSMAN COUNTY, 1945-1969

| | 1945 | 1950 | 1954 | 1959 | 1964 | 1969 |
|---|---|---|---|---|---|---|
| Number of Farms | 2,105 | 2,107 | 2,042 | 1,760 | 1,541 | 1,412 |
| Average Size of Farm (acres) | 637 | 644 | 682 | 772 | 871 | 1,030 |

SOURCE: United States Bureau of the Census, Census of Agriculture, 1969, United States Government Printing Office, Washington, D.C.

Towns and hamlets within the county have offered few employment opportunities for those leaving farming, and all have experienced rapidly declining population during the past three decades. However, county populations continued to increase until the last decade (1960-1970) as rural outmigrants were partially absorbed into the rapidly expanding urban center. The Jamestown population increased by 23 percent during the 1940 to 1950 period and by 23.5 percent in the following decade (1950-1960).[20] The 1.5 percent increase in Jamestown population during the last decade (1960-1970) was not enough to compensate for the reduction in number of rural persons, and county population declined 6.3 percent.[21]

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[19]United States Department of Commerce, Bureau of the Census, Number of Inhabitants, North Dakota, PC(1)A36, Government Printing Office, Washington, D.C., April, 1971, p. 14.

[20]Census figures show population increased 42 percent during the 1950 to 1960 period; however, part of this increase was due to annexation of the State Hospital into the city of Jamestown.

[21]United States Bureau of the Census, Censuses of Population, 1940, 1950, 1960, and 1970, United States Government Printing Office, Washington, D.C.

Further declines in farm employment are suggested by the relatively small proportion (34 percent) of class one and two farms[22] in the county.[23] Current studies indicate the productive capacity of at least a class two farm must be achieved to cover all resource costs.[24] Continued outmigration and a declining population are projected for Stutsman County, as well as all other counties in the region, if alternative sectors are not expanded to absorb the redundant labor supply.

## Objectives of the Study

Jamestown, North Dakota, has been successful in expanding its manufacturing sector during the past five years. Specific objectives of the study were to:

1. Determine the criteria used by industry in selection of the Jamestown area.

2. Measure the interdependence and economic impact that introduction of a manufacturing sector has on an agriculturally dominated rural area.

3. Evaluate employees' attitudes toward their new jobs in manufacturing.

## THE JAMESTOWN SURVEY OF LOCATION FACTORS

The recent expansion of Jamestown's industrial sector indicates a re-evaluation or alteration of location factors has made this site acceptable to manufacturing firms. This portion of the study outlines the characteristics of firms evaluating the Jamestown site and the location factors they considered most important.

## Procedure

Initial meetings with managers of local manufacturing firms were arranged by officials of the Jamestown Industrial Development Corporation in late August, 1972. The Industrial Development Corporation also supplied the names of six additional firms that had considered Jamestown for a plant site during the past five years. Information requested in the questionnaire presented to each of these firms included the number and geographic location

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[22]Class one and two farms are those having gross sales of $20,000 or over.

[23]United States Bureau of the Census, Census of Agriculture, 1969, United States Government Printing Office, Washington, D.C.

[24]Tweeten, op. cit., pp. 178-187.

of all plant sites that had been considered, plus an evaluation of Jamestown location factors. Four firms that decided not to locate in Jamestown returned usable questionnaires[25] by December 1, 1972, and all local firms had completed the questionnaire by February 5, 1973.

## Characteristics of Sample Firms

Four manufacturing firms that have recently located plants in Jamestown and four firms that considered locating there were included in the study. Two of the plants located in Jamestown were of local origin; however, both had evaluated other sites at various stages of their corporate growth. Other locating firms were a branch plant of a Wisconsin corporation and a division of a California corporation. Of the four firms that considered but did not select the Jamestown site, two have plans for establishing branch plants pending croporate growth[26] and two have definitely ruled out the site.

Characteristics of the firms included in the study (Table 2) point out the declining importance of local markets and the emphasis of penetration to regional, national, or international markets.[27] Further diversity of site selection was made possible by the number of firms relying on corporate owned trucks for distribution of product output. While the raw material requirements of most firms were not available locally, the multiple inputs and geographic distribution of those inputs did not restrict plant location to a specific site. Of the 389 employees required by the locating firms, nearly all wage earners were local applicants while most management personnel originated from out of state.[28]

## Narrowing the Selection of Sites

When asked to list all major geographic regions considered for plant location, all eight questionnaire respondents stated that only the Upper Midwest had been considered (Table 3). This singular choice of major geographic region may indicate the Upper Midwest still lacks some attributes to compete nationally for industry, and that industrial growth remains dependent on unique local factors (i.e., regional market penetration, political expediency, local labor related factors, etc.). General areas considered for site selection ranged from North Dakota only by one firm, to four Upper Midwest states evaluated by another. In narrowing the location decision to a specific town or city, one firm considered only Jamestown, while the maximum number of sites that any firm considered was 12. Of the six

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[25]One firm evaluated location factors of a North Dakota city other than Jamestown and one firm did not respond.

[26]Firm managers interviewed indicated no definite preference for the Jamestown site.

[27]Interviews with firm managers, January, 1973

[28]A complete review of the human resource follows on pages 22 through 32.

TABLE 2. CHARACTERISTICS OF FOUR MANUFACTURING FIRMS LOCATING AND FOUR FIRMS WHO CONSIDERED LOCATING IN JAMESTOWN, NORTH DAKOTA (1972).

| Four Locating Firms | Structure and Origin | Product | Marketing Area | Distribution of Product | Basic Raw Material | Raw Material Source | Transport of Raw Material |
|---|---|---|---|---|---|---|---|
| Dakota Bake-N-Serve | Main plant of seven N. and N.E. United States, Jamestown, N.Dak. | Frozen bread dough | North Dakota, South Dakota, Minnesota | Corp. owned trucks | Flour, vegetable shortening | North Dakota, Minnesota, Wisconsin | Commercial trucking Railroad |
| Western Gear | Flight structures division of Calif. firm | Components for aerospace industry | United States | Commercial trucking | Aluminum bar or sheets | West Coast | Air freight |
| Haybuster | One plant--Jamestown, N.Dak. | Farm machinery | Western United States, Canada | Corp. owned trucks | Steel | Minnesota, Great Lakes Area | Corp. owned trucks |
| Rollohome | Branch plant of Wis. firm | Mobile homes | Upper Midwest, Alaska, Canada | Dealer owned trucks | Steel Lumber Home furnishings | United States | Commercial trucking Railroad |
| **Four Firms Not Locating** | | | | | | | |
| Steiger Tractor | Fargo, N.Dak. | Farm machinery | United States, Canada | Corp. owned trucks | Steel Components from other firms | United States | Corp. owned trucks Commercial trucking Railroad |
| Merwin Meats | Hettinger, N.Dak. | Fresh and prepared meat products | Western North Dakota, Western South Dakota | Corp. owned trucks | Livestock | Western North Dakota, Western South Dakota, Montana | Commercial trucking |
| Versatile Tractor | Winnipeg, Manitoba | Farm machinery | United States, Canada, France, Germany | Commercial trucking Ship | Steel Components from other firms | Canada, United States, Great Britain, Japan, Germany | Commercial trucking Railroad |
| Great Western Malting | Vancouver, Wash. | Malt | Western United States, Canada, Orient | Railroad Ship | Barley | Pacific Northwest | Railroad |

Source: Interviews with plant managers, January, 1973.



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TABLE 3. MANUFACTURING SITE SELECTION BY MAJOR GEOGRAPHIC REGIONS, GENERAL AREAS, SPECIFIC SITES, AND TOTAL NUMBER OF SITES CONSIDERED, 1973

| Four Firms Locating in Jamestown | Major Geographic Regions Considered | General Areas Considered | Total No. of Sites Considered | Specific N. Dak. Sites Considered |
|---|---|---|---|---|
| A | Upper Midwest | North Dakota, South Dakota | 7 | Jamestown, Fargo Bismarck, Mandan |
| B | Upper Midwest | North Dakota | 1 | Jamestown |
| C | Upper Midwest | North Dakota | 3 | Jamestown, Minot, Bismarck |
| D | Upper Midwest | North Dakota, Montana, Nebraska, Colorado | 12 | Jamestown |
| **Four Firms Not Locating in Jamestown** | | | | |
| E | Upper Midwest | North Dakota, South Dakota, Minnesota | 10 | Jamestown, Fargo, Valley City, Cooperstown, Grand Forks |
| F | Upper Midwest | North Dakota, South Dakota | 6 | Jamestown, Fargo, Minot, Grand Forks |
| G | Upper Midwest | North Dakota | 4 | Jamestown, Fargo, Minot, Oakes |
| H | Upper Midwest | North Dakota, Minnesota | 8 | Jamestown, New Rockford, Carrington, Wahpeton |

firms that relocated or remained located in North Dakota,[29] five chose sites in cities of over 15,000 population; and the sixth firm evaluated location factors in only those cities of at least that population.[30] Reasons most frequently mentioned for preference of larger North Dakota cities were the larger labor pool available and the opinion that social disruption in the community caused by temporary employee layoffs is inversely related to total population.[31]

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[29]Three firms originated in North Dakota and three originated outside the Midwest.

[30]The sixth firm remains in a North Dakota city of under 15,000 population, but is considering relocating.

[31]Interviews with firm managers, January, 1973.

## Evaluation of Jamestown Location Factors

The balance of the questionnaire listed 37 location factors and asked respondents to indicate the degree of influence each factor had in the selection or rejection of the Jamestown site. The location factor could be evaluated as a "strong positive influence," "slight positive influence," "not considered," or a "negative influence."[32] Numerical values of two, one, zero, and negative one, respectively, were used to weight each factor evaluation by points. The weighted index of each firm's evaluation of location factors was then totaled to measure its relative importance. In addition, closely related location factors were grouped together[33] and an average weighted index was determined (Table 4). The maximum index any factor could have would be 16 if all firms stated it was a strong positive influence to site selection. A minimum score of negative eight would result if all firms stated the location factor had been a negative influence.

The reaction to Jamestown location factors by the sample firms was contradictory to previous studies that had discounted the effectiveness of subsidies, incentives, and local attitudes in attracting industry.[34] In general, studies throughout the United States revealed that incentives and subsidies were either ineffective in influencing the plant site selection or were ranked well below location factors related to the labor resource, product markets, raw material source, and transportation. It should be emphasized that all firms included in the Jamestown survey had already narrowed their site selection to the Upper Midwest; however, the dominant consideration given local subsidies and attitudes toward industry indicate these factors are highly significant in final selection of the intraregional site. The positive evaluation given "local reaction to industry" reflects the near universal community support of industrial promotion.[35] Service clubs and organizations have been instrumental in generating support and in informing the local population of the necessity of industrial development. The principal impetus, however, has come through the organized efforts of the Jamestown Chamber of Commerce and the Jamestown Industrial Development Corporation (JIDC).[36] Functions of the Chamber include seeking out firms

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[32]The number of firms that evaluated each location factor under a given designation is shown in Appendix Table 1, p. 38.

[33]Closely related location factors were scrambled within the questionnaire in an effort to eliminate biased answers caused by the preceding question.

[34]The complete thesis reviews a number of studies (pp. 50-64) in which the effectiveness of these location factors is measured.

[35]Interviews with clergy of six religious denominations, officials of the Jamestown Chamber of Commerce, and officials of Jamestown Industrial Development Corporation.

[36]The JIDC, incorporated in 1957, was capitalized at $100,000 through stock sales within the Jamestown business community. The 1972 financial statement shows assets and liabilities of $1,207,969. Liabilities include loans from the Bank of North Dakota (MIDA bonds), Small Business Association, Jamestown National Bank, and Fargo National Bank. Assets include ownership or notes receivable on plant sites and buildings.

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TABLE 4. WEIGHTED INDEX[a] OF LOCATION FACTORS BY FOUR FIRMS LOCATING, AND FOUR FIRMS WHO CONSIDERED LOCATING, IN JAMESTOWN, NORTH DAKOTA (1973).

| Location Factor | Weighted Index | | |
|---|---|---|---|
| | Locating Firms | Nonlocating Firms | All Firms |
| 1. LOCAL REACTION TO INDUSTRY: AVERAGE | 6.33 | 7.00 | 13.33 |
| Cooperation of Jamestown Businessmen | 7 | 7 | 14 |
| Industrial Promotion (Information) | 6 | 7 | 13 |
| Community Attitudes Toward Industry | 6 | 7 | 13 |
| 2. SUBSIDIES: AVERAGE | 6.80 | 6.40 | 13.20 |
| Plant Rent or Construction Cost | 8 | 7 | 15 |
| Building Site | 8 | 5 | 13 |
| Subsidies and Incentives | 6 | 7 | 13 |
| Waiver of Taxes | 6 | 7 | 13 |
| Grants or Concessions | 6 | 6 | 12 |
| 3. CAPITAL: AVERAGE | 4.00 | 8.00 | 12.00 |
| Capital Costs (Plant and Equipment) | 5 | 8 | 13 |
| Operating Capital (Cost and Availability) | 3 | 8 | 11 |
| 4. LABOR: AVERAGE | 5.83 | 3.50 | 9.33 |
| Labor Costs | 6 | 5 | 11 |
| Willingness of Laborers | 7 | 3 | 10 |
| Labor Unions | 6 | 3 | 9 |
| Labor Relations | 5 | 4 | 9 |
| Trainable Labor Supply | 4 | 5 | 9 |
| Labor Laws | 7 | 1 | 8 |
| 5. PRODUCT MARKETS | 5.00 | 3.00 | 8.00 |
| 6. STATE AND LOCAL TAXES | 3.00 | 4.00 | 7.00 |
| 7. TRANSPORTATION: AVERAGE | 2.67 | 2.67 | 5.33 |
| Transportation Costs to Market | 5 | 2 | 7 |
| Transportation Facilities | 2 | 3 | 5 |
| Transportation Costs of Raw Material | 1 | 3 | 4 |
| 8. LIVING CONDITIONS: AVERAGE | 1.33 | 2.83 | 4.17 |
| Living Conditions of Key Personnel | 1 | 7 | 8 |
| Worker's Happiness and Well-Being | 3 | 3 | 6 |
| Recreational Facilities | 1 | 4 | 5 |
| Medical and Educational Facilities | 1 | 2 | 3 |
| Living Costs | 1 | 1 | 2 |
| Climate | 1 | 0 | 1 |
| 9. PREFERENCE FOR HOME STATE | 2.00 | 2.00 | 4.00 |
| 10. UTILITIES: AVERAGE | 1.00 | 2.00 | 3.00 |
| Water Supply | 2 | 4 | 6 |
| Fuel (Costs and Availability) | 3 | 1 | 4 |
| Electricity | -2 | 1 | -1 |
| 11. RAW MATERIAL | 1.00 | 1.00 | 2.00 |
| 12. INDUSTRIAL CONCENTRATION: AVERAGE | - .40 | .60 | .20 |
| Vocational Training Facilities | 1 | 1 | 2 |
| Abundance of Skilled Labor | 2 | -1 | 1 |
| Availability of Contractors | -2 | 3 | 1 |
| Availability of Subcontractors | -2 | 1 | -1 |
| Byproducts of Other Industries | -1 | -1 | -2 |

[a]Respondents evaluated each Jamestown location factor as "Strong Positive Influence," "Slight Positive Influence," "Not Considered," or "Negative Influence." Numerical values of two, one, zero, and negative one, respectively, were used to weight each factor by points.

that are considering relocating and advertising the merits of plant location in Jamestown. The JIDC outlines and makes available financial incentives to firms with definite interest in the Jamestown site.

Financial incentives are designed specifically for each firm to defray costs of relocating or for local expansion. Concessions received by locating firms have included outright grants for plant equipment or relocating costs, interest-free loans with no repayment of principal for 10 years, buildings made available under long-term lease contracts plus purchase options, and lease or purchase contracts on plant sites below market value. In addition, manufacturing firms are initially granted a five-year waiver of real estate and state income taxes.[37] Impact of these concessions is shown by a 90 percent positive evaluation[38] given the individual location factors that make up "subsidies." The average weighted index of all subsidies ranks only slightly below the top ranked location factor. Further, the third ranked location factor, "capital," may partially reflect the favorable terms granted in purchase of plant and equipment.

Findings of the Jamestown survey were consistent with national studies that revealed the importance of the labor resource in industrial site selection. Labor related factors achieved an average weighted index fourth highest of the 12 major location factors. Labor costs were of particular interest with all eight firms expressing positive reaction to this factor. Willingness of laborers and the supply of trainable labor received favorable evaluation with seven positive and one negative reaction in each case. While three of the eight firms did not consider labor unions in their evaluation of the Jamestown site, three of the four locating firms considered it a strong positive influence. Labor laws[39] were also judged a strong positive influence by three of the four locating firms.

The declining importance of local markets is verified to some degree by the mixed reaction to "product markets." Three of the eight firms did not consider this factor in their location decision, two considered it a slight positive influence, while three firms considered it a strong positive influence. No firms indicated product markets were a negative influence in spite of the small proportion of product output that is marketed locally by Jamestown firms.[40]

The evaluation of state and local taxes suggests this factor is becoming more significant in location decisions than had been indicated in empirical studies reviewed.[41] While most national surveys had ranked state

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[37] North Dakota Century Code, Chapter 57, Sections 57.1 and 57.01, Allen Smith Co., Indianapolis, Indiana, 1960.

[38] Firms evaluating the location factors as a strong positive influence or a slight positive influence.

[39] North Dakota has a right-to-work law in effect.

[40] Percentage of product output marketed within the Jamestown Planning Region by the four Jamestown firms ranges from zero to 2 percent.

[41] A review of these studies is found in the complete thesis on pages 47 through 49.

and local taxes of lesser importance in industrial site selection, an increasing consideration for this location factor was noted in recent surveys taken when state and local taxes had assumed a greater proportion of the corporate tax liability.

The Jamestown survey showed only one firm which stated taxes were not considered in choosing a site, while four firms considered it a strong positive influence and two stated it was a negative influence to the Jamestown site. The highly variable response to transportation and living conditions gave no clear indication of their importance to industrial growth. However, the small number of firms stating they were a negative influence suggests the community does not have serious deficiencies in these areas.

Four of the firms evaluating "preference for home state" were of North Dakota origin; however, only two indicated the factor was a positive influence to site selection, while all other firms stated it was not considered. The low weighted index given utilities was caused in large part by the negative reaction to electrical service.[42] This factor (electricity) was judged a negative influence by three firms, was not considered by four firms, and was judged a strong positive influence by one nonlocating firm. The contradictory evaluations given raw material cost and supply were not unexpected in an area having only agricultural products as its basic output. Factors of industrial concentration[43] (agglomeration advantages) ranked last of the 12 major location factors. While it was assumed these economies of concentration would not be expected in an area of emerging industrialization, the negative reaction to some factors may indicate other determinants of site selection must compensate.

## SOCIAL AND ECONOMIC IMPACT OF INDUSTRIALIZATION

The measurable impact of industrialization is dependent on the initial social and economic structure of a given area. Recent studies of industrialization throughout the United States outline the variation in impact that is experienced in different areas. This variable effect may be caused by (1) the degree of unemployed or underemployed resources within a given area, (2) the number and type of basic industries sustaining the local economy, and (3) the orientation of subsequent industries added to the local economy [i.e., "high labor requirements of some firms as opposed to capital intensive orientation of others."][44] In measuring the total impact of

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[42]Interviews with firm managers indicated service and supply of electricity were satisfactory, while rates were higher than at other sites.

[43]Economies of industrial concentration include: availability of vocational training facilities, an abundance of skilled labor, availability of contractors or subcontractors, and the proximity to by-products of other industries.

[44]"Industries Hidden Dividends," Nation's Business, Vol. 74, The Chamber of Commerce of the United States, Washington, D.C., October, 1970, pp. 74-76.

industrialization on a given community, the effects on the private, as well as the public, sector must be considered. The private sector is made up of the labor force, local merchants, and property owners. The public sector consists of all local governing bodies, including those responsible for providing public services.

## Industrial Impact at Jamestown

The impact of introducing a new sector (manufacturing) into a "local" economy was measured within the Jamestown Planning Region. Boundaries of the multicounty planning regions within the state are designed to encompass the maximum interaction among sectors in the region and to minimize leakages of social or economic benefits accruing to local resources. Each of the planning regions is dominated by an urban center which supplies goods and services to its primary trade area,[45] as well as specialty goods and services to the rural trade centers.[46] Other intraregional linkages come about through wholesale activities provided in the urban center and through marketing facilities provided for distribution of basic output of the region.

### Business and Service Sector Impact

In addition to meeting the above demands of a regional center, interviews conducted at Jamestown indicate the added requirements of the manufacturing sector have been met within the existing economic and social facilities. Of the relatively few business firms that have recently been added to the Jamestown business district, none were totally in response to the added demands of the manufacturing sector. It was felt that excess capacity existing in most firms prior to industrialization had been adequate to absorb the increased volume of trade.[47] A similar evaluation of the added demand on public services was expressed. In interviews with persons responsible for medical services, educational facilities, fire protection, and utilities, all stated these services could support the manufacturing sector with existing staff, equipment, and buildings.[48] It was felt that additional

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[45]The primary trade area of a town or city is that area in which over 50 percent of local demand for goods and services is supplied by the given trade center.

[46]Owens, Wayne W.; Elmer C. Vangsness; Jon L. Peterson; and Orland C. Grove, Trade Area Survey, Devils Lake, North Dakota Region, Extension Bulletin No. 6, Cooperative Extension Service, North Dakota State University, Fargo, North Dakota, October, 1969.

[47]Interviews within the Jamestown business community and with John V. Welsh, Executive Director of Jamestown Chamber of Commerce, March, 1973.

[48]Interviews with Emil Wieland, Executive Vice President of the Jamestown Hospital; Mel Kachel, Fire Chief; Pat Hickey, City Engineer; and Les Robinson, District Manager for Ottertail Power Company, March 23, 1973.

men and equipment were needed for adequate police protection; however, it was pointed out that these requirements were only partially attributable to industrialization.[49]

## Impact on the Level of Employment

What appears to be a more than adequate regional labor supply relative to the number of job openings in manufacturing may have further reduced the employment multiplier impact.[50] A 1963 study of the labor force potential in Jamestown and the surrounding area indicated there were 30.7 percent more persons (1,543 workers) available for work in Jamestown industry than the number reported in the 1960 Census of Population.[51] This discrepancy was explained as the number of Jamestown residents and commuters within 30 miles who would accept work if improved employment opportunities were available. A comparable underestimation of the available labor pool at present may be implied by the following considerations: (1) the total employment at Jamestown and total Jamestown population were nearly the same in 1970 as in 1960,[52] (2) unemployment rates were within one percentage point of being equal for the two periods,[53] and (3) the new manufacturing firms report an average of over two applicants per job opening.[54] The local origin of these applicants is documented on pages 26 through 28.

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[49]Interview with Bob Lee, Assistant Police Chief, March 23, 1973.

[50]An employment multiplier effect (initiated by new industry) comes about in the following way. The added demand for local goods and services required by the new firms, plus the demand created by new employees of these firms, increases the need for employees in other sectors to supply these goods and services. Less than one, or as many as three, additional job openings per new industry employee may occur depending on the initial status of the local economy, the type of new industry, and the degree of interaction with other local sectors. Some reduction in the employment multiplier would result from excess capacity in the goods and service sectors.

[51]Belmont, William R., The Labor Force Potential of Non-Metropolitan Urban Areas: With an Application to Jamestown, North Dakota, Bureau of Business and Economic Research, University of North Dakota, Grand Forks, North Dakota, April, 1963.

[52]Total employment at Jamestown increased only 12 percent (5,020 persons employed in 1960 and 5,644 persons in 1970) during the decade. However, the 1970 census was taken before most manufacturing jobs were available and these new positions, plus induced hiring in related sectors, were not reflected in the 1970 census. Jamestown population in 1960 was 15,163 and the 1970 population was 15,402.

[53]North Dakota State Employment Office, Jamestown, North Dakota.

[54]Interviews with managers of four Jamestown manufacturing firms, April 2, 1973.

It should be emphasized that lack of induced hiring (employment multiplier impact) does not necessarily influence the regional economic impact (size of economic multipliers) that is generated through new industry. This may be particularly true in regions where agriculture is the dominant industry. If a large number of small or inefficient farms exist in the region, a consolidation of these units may result in ex-farmers gaining a higher return for their labor through employment in industry. The reduced number of persons left on farms may then have greater returns to their labor by achieving economies of size in their operation.[55] In addition, if new industry employs local persons who are underemployed[56] (those whose jobs contribute little to gross area product), there will be little reduction in the economic impact of industrialization.

## Impact on the Regional Economy

The total economic impact of industrialization within the region was measured as the direct local expenditures made by the new manufacturing firms, plus the additional gross business volume generated through the multiplier process. This primary and secondary impact (multiplier effect) comes about through the following transactions. Inputs purchased from local merchants add to their gross business volume by a like amount. These merchants then spend part of their increased gross income locally, which generates a second round of increased business volume. The spending and respending transactions continue until leakages (expenditures made outside the local economy) prevent further contributions to the local economy.[57]

The magnitude of the secondary impact was estimated through an input-output model specifically designed for planning regions of North Dakota.[58] Output of this research shows the interdependence that exists among the various sectors[59] of the regional economy. The coefficients of interdependence (multipliers) that were derived represent the degree of total impact that will occur between sectors as a result of an additional dollar of local purchases by new industry.

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[55]The trend has been that consolidation of farms is accompanied by adoption of technology (mechanization) with little increase required in the labor input.

[56]Underemployed persons are defined as those earning at least $700 less than the average annual local income.

[57]Hertsgaard, Thor A., "The Garrison Diversion Unit--Its Impact," address delivered at the Upper Missouri Water Users Association, Minot, North Dakota, December 6, 1972.

[58]Senechal, Donald M., Analysis of Validity of North Dakota Input-Output Models, Unpublished M.S. Thesis, North Dakota State University, Fargo, North Dakota, 1971.

[59]A sector is a group of firms engaged in producing similar goods or services.

The multipliers are based on regression analysis, which was used to project the respending of the initial increase in gross business volume. These multipliers were based on those regression coefficients that were significantly different from zero at the 5 percent level of significance. As such, they tend to be conservative estimates of the linkages among sectors and the level of gross business volume generated in other sectors. For example, the column vector of multipliers for Sector 5 (vector of multipliers shown for "transportation" in Table 6) imply no indirect requirements for that sector. The absence of regression coefficients significantly different from zero for the transportation sector was attributed to the extremely small sample size (number of firms in the sector) and the consequent degrees of freedom in the regression analysis for that sector. The fact that there are no indirect requirements of column Sector 13 (government) is based on the assumption that expenditures of that sector are largely exogenous. The rationale for use of coefficients based on regression analysis was the excess capacity noted in most sectors of the Jamestown economy.[60] In addition, the increased income to some households should be reflected in induced spending to different sectors than those of previous expenditure patterns.

The direct economic impact of the expanded manufacturing sector on the Jamestown Planning Region is measured by the total expenditures made by the four firms within the region. This information was gathered through questionnaires submitted to each of the firms. The questionnaires were designed to obtain the allocation of local expenditures made to each of the sectors in the 13-sector model. The aggregate expenditures of the four firms made to each of the local sectors are shown in Table 5.

The direct expenditures of basic industries made to each of the local sectors represents a change in income or gross business volume to the respective sector. A measure of the total increase in gross business volume (direct expenditures plus the respending cycles generated) within the local economy is found by multiplying the fector of direct expenditures (Table 5) by the matrix of interdependence coefficients. These interdependence coefficients (multipliers) are shown in Table 6.

The multipliers in Table 6 are interpreted in the following way. The numbers making up a column sector (multipliers) represent the change in gross business volume to each of the row sectors that is generated per dollar of expenditure to the column sector.[61] For example, an additional dollar expenditure to Sector 8 (retail trade) generates $.07 to Sector 2 through the

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[60]Traditional input-output analysis assumes an added demand for goods and services will cause firms to increase all inputs in the same proportion. The input-output model using regression analysis takes into consideration some excess capacity in the local economy of regions within the state. This implies that not all inputs will need to be increased to meet the new demand for goods and services (less increase in fixed expense or plant expansion), respending of the marginal gross business volume will be less, and the multipliers will be more conservative.

[61]Stated differently, the coefficients in the column sector represent the expenditures to each of the row sectors that are required per dollar of sales to final demand by the column sector.

TABLE 5. ALLOCATION OF EXPENDITURES MADE BY FOUR MANUFACTURING FIRMS TO SECTORS WITHIN THE JAMESTOWN PLANNING REGION, 1972

| Economic Sector | Expenditures |
|---|---|
| 1. Agriculture: Livestock Production | $ 0 |
| 2. Agriculture: Crop Production | 0 |
| 3. Mining | 0 |
| 4. Contract Construction[a] | 32,058 |
| 5. Transportation | 41,089 |
| 6. Communications and Utilities | 105,109 |
| 7. Agricultural Processing and Wholesaling | 0 |
| 8. Retail Trade | 101,570 |
| 9. Finance, Insurance, and Real Estate | 59,454 |
| 10. Business and Personal Services | 11,647 |
| 11. Professional and Social Services | 14,003 |
| 12. Households | 1,645,959 |
| 13. Government | 14,366 |
| TOTAL | $2,025,225 |

[a]Includes only maintenance and repairs.

multiplier process, $.08 to Sector 4, $.02 to Sector 6, $1.13 to Sector 8 (the original one dollar expenditure plus $.13 generated through the multiplier effect), $.03 to Sector 9, etc. The summation of multipliers in column Sector 8 (gross receipts multiplier equal to $1.61) indicates a direct expenditure of one dollar generates an additional $.61 of gross business volume within the local economy through the multiplier effect.[62] Similar interpretations apply for expenditures made within other column sectors.

Manufacturing firms made expenditures to nine column sectors of the 13-sector model. Payments made to a specific column sector were multiplied by the corresponding interdependence coefficients to yield an estimate of the total change in gross business volume. The estimated increase in gross business volume within the Jamestown Planning Region is shown in Table 7.

The elements in the row sectors of Table 7 show the direct and indirect income received by the row sector as a result of expenditures made to the column sector. For example, Sector 8 (retail trade) has an indirect increase in gross business volume of $2,879 as a result of the $32,058 payment to Sector 4, increased income of $24,280 generated through payments to Sector 6, a $115,190 increase through payments to Sector 8 ($101,570 in direct purchases plus $13,620 generated through the multiplier process), increased income of $26,118 generated through expenditures to Sector 9, etc. The total increase in gross business volume for Sector 8 that comes about through

[62]Each dollar of sales to final demand by Sector 8 increases local gross business volume $1.61.

TABLE 6. INTERDEPENDENCE COEFFICIENTS (MULTIPLIERS) BASED ON REGRESSION COEFFICIENTS[a] REPRESENTING SPENDING ON MARGINAL UNITS OF INCOME WITHIN NORTH DAKOTA PLANNING REGIONS

| Selling Sectors | Purchasing Sectors | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 Agricultural Livestock | 2 Agricultural Crops | 3 Mining | 4 Construction | 5 Transportation | 6 Communication and Utilities | 7 Agricultural Processing and Wholesaling | 8 Retail | 9 Finance Ins. and Real Estate | 10 Business and Personal (Nonprofessional) Services | 11 Professional and Social Services | 12 Households | 13 Government |
| 1 | 1.0968 | 0.0000 | 0.0000 | 0.0000 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0015 | 0.0000 | 0.0 |
| 2 | 0.3600 | 1.1101 | 0.0187 | 0.0053 | 0.0 | 0.0137 | 0.8167 | 0.0666 | 0.0258 | 0.0127 | 0.0284 | 0.0291 | 0.0 |
| 3 | 0.0028 | 0.0048 | 1.0018 | 0.0004 | 0.0 | 0.0011 | 0.0036 | 0.0008 | 0.0019 | 0.0010 | 0.0020 | 0.0028 | 0.0 |
| 4 | 0.2410 | 0.2272 | 0.2340 | 1.0586 | 0.0 | 0.1748 | 0.1808 | 0.0777 | 0.2458 | 0.1483 | 0.2592 | 0.3629 | 0.0 |
| 5 | 0.0079 | 0.0022 | 0.0013 | 0.0004 | 1.0000 | 0.0009 | 0.0017 | 0.0043 | 0.0017 | 0.0024 | 0.0034 | 0.0020 | 0.0 |
| 6 | 0.0321 | 0.0295 | 0.0233 | 0.0151 | 0.0 | 1.0611 | 0.0266 | 0.0193 | 0.0478 | 0.0637 | 0.0506 | 0.0361 | 0.0 |
| 7 | 0.1732 | 0.0770 | 0.0013 | 0.0004 | 0.0 | 0.0011 | 1.0567 | 0.0046 | 0.0018 | 0.0009 | 0.0022 | 0.0020 | 0.0 |
| 8 | 0.4927 | 0.5497 | 0.3190 | 0.0898 | 0.0 | 0.2310 | 0.4251 | 1.1341 | 0.4393 | 0.2156 | 0.4758 | 0.4946 | 0.0 |
| 9 | 0.0919 | 0.1026 | 0.0635 | 0.0308 | 0.0 | 0.0739 | 0.0828 | 0.0260 | 1.0917 | 0.0680 | 0.0804 | 0.0985 | 0.0 |
| 10 | 0.0260 | 0.0361 | 0.0156 | 0.0063 | 0.0 | 0.0122 | 0.0277 | 0.0086 | 0.0185 | 1.0148 | 0.0189 | 0.0243 | 0.0 |
| 11 | 0.0204 | 0.0159 | 0.0163 | 0.0049 | 0.0 | 0.0108 | 0.0127 | 0.0052 | 0.0199 | 0.0127 | 1.1124 | 0.0252 | 0.0 |
| 12 | 0.8347 | 0.7843 | 0.8152 | 0.2029 | 0.0 | 0.5095 | 0.6243 | 0.2481 | 0.8517 | 0.4479 | 0.8935 | 1.2639 | 0.0 |
| 13 | 0.0485 | 0.0499 | 0.0269 | 0.0113 | 0.0 | 0.0417 | 0.0424 | 0.0144 | 0.0379 | 0.0253 | 0.0360 | 0.0417 | 1.0000 |
| Gross Receipts Multiplier | 3.4280 | 2.9892 | 2.5369 | 1.4262 | 1.0000 | 2.1318 | 3.3011 | 1.6097 | 2.7838 | 2.0133 | 2.9643 | 2.3831 | 1.0000 |

[a]The interdependence coefficients were based on those regression coefficients significantly different from zero at the 5 percent level. As such, they tend to be conservative estimates of linkages among sectors and the level of gross business volume generated in other sectors.

SOURCE: Senechal, Donald M., Unpublished Department Working Papers, Agricultural Economics Department, North Dakota State University, Fargo, North Dakota, 1972.

TABLE 7. ESTIMATES OF INCREASED GROSS BUSINESS VOLUME IN THE JAMESTOWN PLANNING REGION GENERATED BY LOCAL EXPENDITURES OF FOUR MANUFACTURING FIRMS, 1972

| | Sector to Which Initial Expenditure is Made | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
| Expenditure | $32,058 | $41,089 | $105,109 | $101,570 | $59,454 | $11,647 | $14,003 | $1,645,959 | $14,366 | $2,025,225 |
| Selling Sector | | | | | | | | | | |
| 1 | $ 0 | $ 0 | $ 0 | $ 0 | $ 0 | $ 0 | $ 21 | $ 0 | $ 0 | $ 21 |
| 2 | 170 | 0 | 1,440 | 6,764 | 1,532 | 148 | 398 | 47,897 | 0 | 57,351 |
| 3 | 13 | 0 | 116 | 81 | 113 | 12 | 28 | 4,609 | 0 | 4,971 |
| 4 | 33,937 | 0 | 18,373 | 7,892 | 14,614 | 1,727 | 3,630 | 597,318 | 0 | 677,491 |
| 5 | 13 | 41,089 | 95 | 437 | 101 | 28 | 48 | 3,292 | 0 | 45,101 |
| 6 | 484 | 0 | 111,531 | 1,960 | 2,842 | 742 | 708 | 59,419 | 0 | 177,687 |
| 7 | 13 | 0 | 116 | 467 | 107 | 10 | 31 | 3,292 | 0 | 4,036 |
| 8 | 2,879 | 0 | 24,280 | 115,190 | 26,118 | 2,511 | 6,663 | 814,091 | 0 | 991,733 |
| 9 | 987 | 0 | 7,768 | 2,641 | 64,906 | 792 | 1,126 | 162,127 | 0 | 240,346 |
| 10 | 202 | 0 | 1,282 | 874 | 1,100 | 11,819 | 265 | 39,997 | 0 | 55,538 |
| 11 | 157 | 0 | 1,135 | 528 | 1,183 | 148 | 15,577 | 41,478 | 0 | 60,206 |
| 12 | 6,504 | 0 | 53,553 | 25,200 | 50,637 | 5,217 | 12,512 | 2,080,328 | 0 | 2,233,950 |
| 13 | 362 | 0 | 4,383 | 1,463 | 2,253 | 295 | 504 | 68,636 | 14,366 | 92,262 |
| Total Increase in Gross Business Volume | | | | | | | | | | $4,640,697 |

manufacturers' expenditures within the local economy is $991,733.[63] Sector 1 has total increased business volume of only $21, Sector 2 has increased income of $57,351, Sector 3 has added gross business volume of $4,971, etc.

Total increased business volume to all sectors within the Jamestown Planning Region, as a result of manufacturers' expenditures and local respending of that income, is estimated to be $4,640,697. A direct annual expenditure of $2,025,225 made by the four manufacturing firms to local sectors generates an additional indirect effect of $2,615,472 to yield a total increase in gross business volume of $4,640,697 through the multiplier process. When related to the 389 employees required by the manufacturing firms, an increase in gross business volume of $11,930 per new job is experienced in the Jamestown Planning Region.

## THE HUMAN RESOURCE

Introduction of the local human resource to the "factory system" may be difficult to initiate, or, in some cases, still more difficult to sustain. Research seeking the underlying causes of labor resistance to manufacturing work has been done primarily with workers in heavy industry or with workers in firms using highly specialized assembly line procedures. The conclusions of several of these studies are presented and then contrasted to the attitudes and attributes of Jamestown manufacturing employees.

### Adjustments to Industrial Employment

The attributes industry must necessarily demand from the labor resource are often lacking in newly emerging industrial areas or come about only after a painful transition period. Newcomers to industry, particularly from rural areas, may resist a full commitment to the industrial way of life and problems of excessive absenteeism and labor turnover result.[64] The degree and duration of these and other problems frequently depend on the extent of conditioning to industrial work that the newcomer has experienced through former occupations.

For those with a farm background, their former occupation may have demanded long hours of hard work with little return for their efforts. However, these were his own hours; whereas, the time-discipline and routine of factory life often do not permit even the illusion of independence. The rewards of the agrarian life were often visibly proportional to the dedication to task and were more immediate. Periods of adversity associated with the person's farm life seemed more like "acts of God," while

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[63] Stated differently, the current level of manufacturers' export sales requires $991,733 in direct and indirect purchases from the local retail sector.

[64] Willensky, H. L., and C. N. Lebeaux, Industrial Society and Social Welfare, Russell Sage Foundation, New York, 1958, p. 57.

risks incurred in the new industrial existence seem more the result of "unreasonable" demands of men or machines.[65]

For some newcomers, the necessity for coordination and control of the specialized activities in the factory system results in the obsolescence of his socially recognized skills and a regimentation to time rather than task. This transition to industrial employment may involve "problem areas" related to the workman's loss of liberty, status, or security.[66]

### Industrial Employment and Loss of Liberty

Loss of liberty essentially involves the range of conditions that have traditionally been subject to the worker's control. Industrialization may require a job design more compatible with worker specialization and less personal decision making. While the fractionalization of job design required by specialization may meet the goals of minimizing immediate costs and maximizing immediate productivity, critics point out that minimum immediate costs are not the same as minimum economic costs. The latter includes social costs resulting from depersonalization of the job and worker anonymity, which are reflected in worker dissatisfaction.[67]

### Industrial Employment and Loss of Status

Loss of occupational status is cited as a problem closely related to reduction of the worker's liberty. The obsolescence of skills, or the inability to transfer them to the mechanized demands of industrial organization, often leads to a drastic decline in job satisfaction and self-esteem. For those with a farm background, the nontransfer of skills becomes an additional inhibiting factor to acceptance of industrial discipline. Persons with a craft background may find their skills lost to the speed and standardization required of factory output. Those formerly employed in the service sector often find the repetitious demands of mechanization a bland comparison to the human interaction experienced in their former work. The acquisition of new skills and status may be a near impossibility for workers subjected to extreme job specialization. Under this type of job design, processes formerly handled by one person are torn apart and the separate components or tasks are then mechanized and assigned to semiskilled workers. As a result, workers may suffer a "loss of workmanship" or "pride of craft" and lose socially identifiable or recognized skills.[68]

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[65] Ibid., pp. 57-58.

[66] Moore, Wilbert E., Industrial Relations and the Social Order, The Macmillan Co., New York, 1951, pp. 241-242.

[67] Siegel, Lawrence, Industrial Psychology, Richard D. Irwin, Inc., Homewood, Illinois, 1969, p. 359.

[68] Wilensky and Lebeaux, op. cit., pp. 60-61.

## Industrialization and Loss of Job Security

Industry spokesmen, in answer to problems outlined beforehand, point to technological change that may ultimately extend to virtual elimination of unskilled repetitive work.[69] The substitution of computer technology and automation for such work suggests that jobs which demand worker subservience to the machine may be a model of the past, not the future.[70]

While the development and adoption of such innovations may resolve industry's employee problems of the future, these things may be major contributors to one other "problem area" of the present--that of job security. Potential and present workers in industry find that the most important question they may face with respect to increasing mechanization is how it will affect their means of livelihood. The individual finds little security in the fact that technological change also creates demands for new skills, even within any given industrial plant. These new skills are unlikely to be sufficiently similar to those of the displaced person and recruitment of labor for the new position frequently takes place outside the plant. In addition, various studies indicate that skilled workmen who are displaced by some technological or similar modification tend to remain unemployed longer than those less skilled. This suggests that the person who has achieved a certain skill or status will seek re-employment in his own kind of work, or at least at his customary level, and only with reluctance will he seek retraining or employment at a lower level.[71]

## Industrialization and the Young Worker

The introduction of the young worker into "factory life" has presented unique labor problems or intensified old ones. Siegel writes that "the origins of attitudes toward work are learned early in the course of socialization and internalized as determinants of adult behavior."[72] Today, such conditioning is being challenged by a new generation in which much of the fear of being unemployed has disappeared, along with the notion that hard work is virtue in itself.[73] Gone is the concept Henry Ford expressed in 1922 that all that the industrial worker wants is a job in which he does not have to think. As education has increased, job expectations have grown infinitely greater. A recent national survey indicates that what working Americans now want most from their jobs is that they be in some way interesting.[74]

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[69]Moore, op. cit., p. 244.

[70]Wilensky and Lebeaux, op. cit., pp. 97-99.

[71]Moore, op. cit., pp. 244-245.

[72]Siegel, op. cit., p. 360.

[73]"Bored on the Assembly Line," Life, Time, Inc., Chicago, September 1, 1972, pp. 30-36.

[74]Ibid., p. 38.

## Industry's Outlook on the Human Resource

Industry users of the human resource have responded to criticisms with an increased awareness that labor utilization solely for the short-sighted interests of market competition or increased dividends is ineffective. The idea that technological change is self-generating, self-directing, and inevitable is increasingly being tempered by considerations for the individual worker.[75] Labor resource innovations, such as "job enrichment" (more individual responsibility, authority, feedback of results, and encouragement), sensitivity courses to promote worker-supervisor understanding, incentive plans that merge human and productive goals, plus other labor-management modifications, verify the new status industry places on the human resource component.[76]

## The Jamestown Survey of Manufacturing Employees

The degree to which the above problems may exist or have been resolved at a local level, plus the adjustments required of the labor resource, were measured by a survey of manufacturing employees in the Jamestown Planning Region. All employees (389 persons)[77] of the manufacturing firms included in the study were chosen as the population.

### The Questionnaire

Questionnaires were distributed with the payroll checks of the four firms' employees during the last week of September, 1972. A stamped, self-addressed envelope was provided so respondents would not have to return the confidential questionnaire to the firm they were evaluating. During October, posters were displayed within the plants requesting that employees return the questionnaires. A letter appealing to nonrespondents for returns was distributed with payroll checks in late October. On the cutoff date for tabulation (December 9, 1972), 98 of 389 total employees had returned usable questionnaires for a response rate of 25.2 percent.[78]

### Tabulation and Method of Analysis

Questionnaire response was tabulated and transferred to computer cards for analysis using the Statistical Package for the Social Sciences

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[75]Moore, op. cit., p. 249.

[76]Life, op. cit., p. 38.

[77]Number of employees of the four firms included in the study were 60, 65, 72, and 192.

[78]All returned questionnaires were usable with only .15 percent of the questions left unanswered.

program.[79] Output of this program included statistical tests of the relationship between relevant combinations of discrete and continuous variables in the questionnaire. Survey results designated statistically significant are the results of "F"-ratios (simple analysis of variance) and chi-square statistics (Pearson's chi-square test) that were significant at the 5 percent level with the appropriate degrees of freedom.

## Survey Results

Response to the initial portion of the questionnaire outlined the personal characteristics of manufacturing employees.[80] Noteworthy among these characteristics were the age distribution and the education level of employees (Table 8).[81] Nearly 44 percent of the respondents were in the 19 to 24 age distribution, 63.3 percent were less than 30 years old, while only 19.4 percent of the employees were over 40 years old. These figures indicate a significant reduction in outmigration of young mobile workers through the employment opportunities provided by the new manufacturing firms.

TABLE 8. PROFILE OF JAMESTOWN MANUFACTURING EMPLOYEES BY AGE DISTRIBUTION AND EDUCATION LEVEL, 1972

| Age: | | | | | |
|---|---|---|---|---|---|
| 19-24 | 25-29 | 30-39 | 40-49 | 50-59 |
| 43.9% | 19.4% | 17.3% | 12.2% | 7.2% |

| Education: | | | | | | |
|---|---|---|---|---|---|---|
| Grd. 1-8 | Grd. 9-11 | H.S. Grad. | Tech. S. Grad. | 1-3 Yrs. Clg. | Clg. Grad. | Post Grad. Study |
| 17.3% | 5.1% | 31.6% | 6.1% | 25.5% | 11.2% | 3.1%[a] |

[a]Distribution percentages may not equal 100 due to rounding.

[79]Nie, Norman H.; D. H. Bent; and C. H. Hull, Statistical Package for the Social Sciences, McGraw-Hill Book Co., New York, 1970, pp. 4, 97, 98, 103-105, 115-126, 134-140, 275, 276.

[80]A complete summary of employee characteristics is shown in Appendix Table 2.

[81]The text and tabular summation of results are presented only as percentages. However, since the sample size consisted of 98 respondents, percentages and number of persons responding are highly comparable. For example, a percentage response of 19.4 percent represents 19 people, 43.9 percent represents 43 respondents, 77.6 percent represents 76 persons, etc.

A cross tabulation of age by level of education revealed statistically significant results comparable to state and national findings. Of those persons in the 19 to 29 year old distribution, 89 percent had completed high school and 52 percent had one or more years of education beyond high school. Seventy percent of the 30 to 39 year olds completed high school and 47 percent had a year or more of formal education beyond high school. Seventy-five percent of 40 to 49 year olds had completed high school, but only 33 percent had attended college or technical school. None of the 50 to 59 year olds stated they had a high school education. The work force was made up of 77.6 percent male employees and 22.4 percent female workers. Seventy-five percent of the employees were married, with the number of children averaging slightly less than one child per family.

Place of residence and commuting patterns indicated by manufacturing employees deviated from anticipated results. It had been thought a substantial number of workers would be represented by persons living in nearby small towns and by persons operating or residing on farms within the region. The survey revealed that 93.9 percent of the employees were currently residing within Jamestown, while only 3.1 percent commuted from farms[82] and 3.1 percent commuted from small towns.[83] An average commuting distance of 3.2 miles for all employees reflects more the location of plants around the periphery of Jamestown[84] rather than a daily influx of workers to the city.

The high proportion of workers who reside in Jamestown is partially explained by the number of persons moving to the city when employed in manufacturing. Thirty-six persons in the sample (36.7 percent) indicated they had changed residence when accepting their current job. Of this number, only 16.6 percent had formerly resided within the Jamestown Planning Region (Table 9). The relatively high percentage of Jamestown immigrants originating in urban areas outside North Dakota indicated the influx of managerial personnel required by the new manufacturing sector.[85]

Former occupations listed by all respondents showed a highly diverse background in the labor resource. The percentage of employees who listed their former occupation as either farm operators or laborers (Table 10) points out the significance of local employment opportunities as an alternative to outmigration for persons no longer required in agriculture. The high proportion of persons listed in the service sector (27.6 percent) is an aggregation of workers formerly employed as mechanics, service station attendants, bookkeepers, teachers, secretaries, etc. Former occupations

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[82]Two respondents stated they were principal operators of small farms, one person rented a farm residence, and two persons had rented out their farms and moved to Jamestown.

[83]A complete summary of residence and commuting patterns is shown in Appendix Table 3.

[84]Plant sites are located one to three miles from downtown Jamestown.

[85]Respondents were asked to designate current position held within the firm, as well as former residence.

TABLE 9. FORMER RESIDENCE OF 36 PERSONS WHO MOVED TO ACCEPT WORK IN JAMESTOWN MANUFACTURING FIRMS, 1972

| Former Residence | Number | Percent |
|---|---|---|
| Farm Near Jamestown | 3 | 8.3 |
| Small Town Near Jamestown | 3 | 8.3 |
| Rural North Dakota[a] | 13 | 36.1 |
| Urban North Dakota[b] | 6 | 16.7 |
| Urban United States[c] | 11 | 30.6 |

[a]Farms and towns of less than 2,500 population outside the Jamestown Planning Region.

[b]North Dakota cities with over 2,500 population other than Jamestown.

[c]Cities outside North Dakota of over 2,500 population.

TABLE 10. PERCENTAGE OF JAMESTOWN MANUFACTURING EMPLOYEES BY FORMER OCCUPATION AND CURRENT POSITION HELD WITHIN THE FIRM, 1972

| Former Occupation | Percent |
|---|---|
| Farm Operator | 10.2 |
| Farm Laborer | 9.2 |
| Construction Work | 8.2 |
| Transportation | 10.2 |
| Service Sector | 27.6 |
| Retail | 4.1 |
| Manufacturing | 4.1 |
| Management or Technician | 11.2 |
| Military | 8.2 |
| Student | 7.1[a] |
| **Current Position Held With Firm** | |
| Laborer | 3.1 |
| Semiskilled Labor | 74.5 |
| Skilled Labor | 3.1 |
| Management | 19.4[a] |

[a]Distribution percentages may not equal 100 due to rounding

in the transportation industry included truck drivers and railroad workers. Cross tabulation of "former occupation" by "impact of manufacturing employment on standard of living"[86] was statistically significant and indicated upward job mobility had been substantially greater for persons formerly employed in the transportation or service sectors. Despite the diverse occupational background of workers (only 4.1 percent were experienced in manufacturing work), 56.1 percent of the employees felt their former skills were useful in their current job. Transfer of skills, plus job training given 51 percent of the new workers, was reflected in 74.5 percent of the employees classed as semiskilled compared to 3.1 percent classed as common laborers.[87]

Determinants of job selection expressed in Table 11 show "opportunity for advancement," "best paying job available," and "only work available" dominated other considerations in choosing manufacturing work. "Opportunity for advancement," the job criterion most frequently mentioned by male employees (53.9 percent), typifies the desire for upward job mobility found in younger workers.[88] The percentage of male employees who expressed career interests in farming (21.1 percent)[89] again suggests manufacturing employment offers an alternative to outmigration for a significant number of area residents. The criterion "believed no work was available outside the area" was included to determine if employees accepted their current job through lack of alternatives. Inclusion of "laid off at former plant" was a result of hypothesized return of former residents because of the severe reduction in the aerospace industry and generally high unemployment rates at the time.[90] Neither of the last two criteria proved significant to a large number of people. Those who were influenced by them mentioned other criteria as well.

Of those who accepted work with Jamestown manufacturing firms, 61 percent stated they had improved their standard of living, 30 percent maintained their standard of living, and 9 percent stated they experienced a decline in their standard of living (Table 12). A breakdown of "impact of

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[86]Employees were asked if current work in manufacturing improved, lowered, or had no effect on their standard of living.

[87]The classification of job positions with titles unique to the manufacturing industry was confirmed with personnel managers as to the skill and training required for that position.

[88]A cross tabulation of age by job choice criteria showed "opportunity for advancement" mentioned by 68.4 percent of the 25 to 29 year olds, 50.0 percent of the 40 to 49 year olds, while none of the 50 to 59 year olds were influenced by this criterion (chi-square test statistically significant at the .05 level).

[89]Respondents could express several criteria for choice of manufacturing work; however, response to "unable to make a living farming," "no farm work," and "no farm credit" were mutually exclusive and, therefore, allowed aggregation of response to these criteria.

[90]The national unemployment rate was over 6 percent during the survey period.

TABLE 11. CRITERIA FOR CHOICE OF MANUFACTURING WORK[a]--AN EVALUATION BY JAMESTOWN MANUFACTURING EMPLOYEES, 1972

| Variable | Influenced Choice of Job | | | Did Not Influence Choice of Job | | |
|---|---|---|---|---|---|---|
| | Male | Female | All | Male | Female | All |
| Best Paying Job | 47.4% | 68.2% | 52.0% | 52.6% | 31.8% | 48.0% |
| Opportunity for Advancement | 53.9% | 31.8% | 49.0% | 46.1% | 68.2% | 51.0% |
| Only Work Available | 36.8% | 50.0% | 39.8% | 63.2% | 50.0% | 60.2% |
| Job Training | 21.1% | 0 % | 16.3% | 78.9% | 100.0% | 83.7% |
| Unable to Make a Living on Farm | 9.2% | 0 % | 7.1% | 90.8% | 100.0% | 92.9% |
| No Farm Credit | 6.6% | 0 % | 5.1% | 93.4% | 100.0% | 94.9% |
| No Farm Work | 5.3% | 0 % | 4.1% | 94.7% | 100.0% | 95.9% |
| Believed No Work Outside the Region | 6.6% | 0 % | 5.1% | 93.4% | 100.0% | 94.9% |
| Laid Off | 6.6% | 0 % | 5.1% | 93.4% | 100.0% | 94.9% |

[a]Employees could designate more than one criterion for choice of job.

TABLE 12. AVERAGE ANNUAL SALARY AND ITS IMPACT ON THE STANDARD OF LIVING OF JAMESTOWN MANUFACTURING EMPLOYEES, 1972

Average Annual Salary of Manufacturing Employees:[a]

| Male Employees | Female Employees | Average of All Employees' Salaries |
|---|---|---|
| $7,500 to $8,000 | $4,000 to $4,500 | $6,500 to $7,000 |

Impact of Manufacturing Job on Standard of Living:

| Improved | | | Lowered | | | Same | | |
|---|---|---|---|---|---|---|---|---|
| Male | Female | All | Male | Female | All | Male | Female | All |
| 60.5% | 63.6% | 61.2% | 9.2% | 9.1% | 9.2% | 30.3% | 27.3% | 29.6% |

[a]All employees worked full-time year around.

manufacturing employment on standard of living" by "current position held with firm" revealed that a proportionately greater number of persons in managerial positions had experienced a decline in their standard of living.

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While 91 percent of the respondents indicated that work in manufacturing improved or sustained their standard of living, there were some indications that the new employment required greater time discipline by the individual. When asked to compare the amount of vacation and recreation time allowed by their current manufacturing job to their former occupation, 42 percent of the male employees stated they now had less free time (Table 13). Forty-six percent of the male employees indicated they now felt more regimented in the hours they must work, in their freedom to take time off, or in choosing their pace for completion of work.

TABLE 13. FREE TIME ALLOWED BY MANUFACTURING WORK COMPARED TO FORMER OCCUPATION--AN EVALUATION BY JAMESTOWN MANUFACTURING EMPLOYEES, 1972

Vacation and Recreation Time Manufacturing Job Allows:

| More | | | Less | | | Same | | |
|---|---|---|---|---|---|---|---|---|
| Male | Female | All | Male | Female | All | Male | Female | All |
| 23.7% | 27.3% | 24.5% | 42.1% | 22.7% | 37.8% | 34.2% | 50.0% | 37.8% |

Time Manufacturing Job Allows With Family:

| More | | | Less | | | Same | | |
|---|---|---|---|---|---|---|---|---|
| Male | Female | All | Male | Female | All | Male | Female | All |
| 19.7% | 18.2% | 19.4% | 27.6% | 40.9% | 30.6% | 52.6% | 40.9% | 50.0% |

Time Discipline Required by Manufacturing Job:[a]

| More | | | Less | | | Same | | |
|---|---|---|---|---|---|---|---|---|
| Male | Female | All | Male | Female | All | Male | Female | All |
| 46.1% | 18.2% | 39.8% | 11.8% | 27.3% | 15.3% | 42.1% | 54.5% | 44.9% |

[a]Time or personal discipline was defined in the questionnaire as requirements to work certain hours, freedom to take time off, deadline for completion of work, etc.

While the survey indicates a greater time discipline is experienced by employees, a surprising number of respondents indicated less task discipline is required. When asked if they felt more or less supervised on their current job, 42 percent of the male employees stated they now enjoyed greater independence in carrying out their assigned role (Table 14). Sixty-three percent of the male respondents felt their job role was compatible with their level of skill and training, while 35.5 percent felt they were capable of more advanced or complex positions.

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TABLE 14. WORK DISCIPLINE REQUIRED AND JOB POSITION RELATIVE TO EMPLOYEES' LEVEL OF SKILL AND TRAINING--AN EVALUATION BY JAMESTOWN MANUFACTURING EMPLOYEES, 1972

Degree of Independence in Carrying Out Manufacturing Job Function:

| Greater | | | Less | | | Same | | |
|---|---|---|---|---|---|---|---|---|
| Male | Female | All | Male | Female | All | Male | Female | All |
| 42.1% | 54.5% | 44.9% | 25.0% | 13.6% | 22.4% | 32.9% | 31.8% | 32.7% |

Position in Manufacturing Firm Compared to Level of Skill and Training:

| About Right | | | Below | | | Too Demanding | | |
|---|---|---|---|---|---|---|---|---|
| Male | Female | All | Male | Female | All | Male | Female | All |
| 63.2% | 59.1% | 62.3% | 35.5% | 40.9% | 36.7% | 1.3% | 0% | 1.0% |

## SUMMARY AND CONCLUSIONS

### Summary

Many Midwest communities have sought new industry to compensate for the changing resource requirements of agriculture and to diversify the economic base of the local economy. A case study of a community that has been successful in attracting industry was undertaken to determine the impact on social and economic entities within that area. The Jamestown Planning Region, located in east-central North Dakota, was chosen as the study area. The nine-county region typifies a rural area heavily dependent on agriculture. Farm population, as well as most small towns and cities, experienced population declines during the last decade. Jamestown, one of only two urban centers within the region (population 15,402), had only a 1.5 percent population increase during the same period.

Primary data for the study were gathered from managers and personnel of four manufacturing firms recently locating in Jamestown, from firms who had evaluated the site, and from business and civic leaders of the city. This information was used to determine the criteria used by industry in selection of Jamestown as a plant site and to measure the economic impact of industrialization within the region. The results of a labor survey within the new manufacturing plants were used to evaluate employees' attitudes toward their new job in manufacturing.

### Location Factors

Questionnaires completed by four firms locating in Jamestown and four additional firms who had evaluated the site pointed out location factors considered the most important. All eight firms had considered only Upper Midwest plant locations. The number of specific sites considered within the six Midwest states varied from Jamestown only by one firm to a maximum of 12 sites considered by another. The questionnaire included 37 location factors and asked respondents to indicate the degree of influence each factor had in

consideration of Jamestown as a plant site. Response to each factor was given a weighted index, closely related factors were aggregated, and their mean index determined. Favorable or unfavorable reaction to the 12 major location factors was measured by an index ranging from a positive 16 to a negative 8.

The top rated location factors, "local reaction to industry" and "subsidies," had weighted indices of 13.3 and 13.2, respectively. These scores reflect the active promotion of Jamestown as an industrial site and the positive attitudes and cooperation of local residents and businessmen. They further point out the effectiveness of local grants and concessions made available to manufacturing firms considering alternative plant sites. In addition, the favorable reaction to the third ranked location factor, "capital," was partially due to low cost plant and equipment loans made available from local sources. Labor related factors were ranked fourth highest of the 12 major location factors with an index of 9.3. Individual components of this factor that were rated particularly high by the Jamestown firms were "willingness of local workers" and "North Dakota labor laws."

The declining importance of local markets was verified to some degree by the reaction to "product markets." No respondents evaluated this factor as a negative influence to site selection in spite of less than 2 percent of the output of Jamestown firms being marketed within the region. The reaction to "state and local taxes" indicates this factor does enter into the decision-making process of site selection. Only one firm stated taxes were not considered, while four firms stated they were a strong positive influence, and two firms considered them a negative influence. Factors related to transportation and living conditions received inconsistent evaluations by the eight firms; however, the small number of firms stating they were a negative influence suggests Jamestown does not have serious deficiencies in these areas.

Location factors considered least important, or a negative influence to the Jamestown site, were "utilities," "raw materials," and "economies of industrial concentration." Indices computed for these factors were 3.0, 2.0, and 0.2, respectively. Factors that contribute to economies of industrial concentration were evaluated as a negative influence to the Jamestown site by the greatest number of firms. The location factors judged as particularly deficient in meeting the needs of a manufacturing sector were the supply of skilled labor, the availability of contractors and subcontractors, and proximity to by-products of other industries.

## Economic Impact

Measures of industrial impact were determined through interviews within the business and public service sectors of Jamestown and through questionnaire response stating the local expenditures made by the four manufacturing firms. The added demand for commercial goods and services resulting from industrial expansion was met through excess capacity in existing business sectors rather than large-scale expansion of these sectors. In addition, it was found that medical services, educational facilities, fire protection, and utilities could be supplied to the manufacturing sector with existing staff, equipment, and buildings. Only in police protection was it felt that additional men and equipment would be needed to supply this service to manufacturing plants and personnel.

There were indications that the nearly 400 jobs provided in manufacturing had little employment multiplier effect within the region. The following reasons were responsible for the minimal secondary impact: (1) the excess capacity in the business and public service sectors included labor inputs sufficient to meet the increased demands of industrialization, (2) the number of rural and urban underemployed persons in the region who experienced upward mobility in their occupations rather than there being an influx of workers to fill manufacturing positions, and (3) a decline in outmigration that would have taken place if employment opportunities had not been available.

The total economic impact of manufacturers' expenditures within the region was estimated by input-output analysis. The input-output model employed was one designed at North Dakota State University for use in economic impact studies within planning regions of the state. The model shows the interdependence that exists among the 13 sectors that make up the regional economy. Regression analysis was used to project the level of economic interaction among sectors that will result from a change in basic industry expenditures within the region. Multipliers based on regression coefficients measure the direct and indirect income that will accrue to each local sector per unit change of basic industry expenditure.

Aggregate expenditures within the Jamestown Planning Region by the four manufacturing firms were $2,025,225 annually. Of this amount, 81.3 percent was paid as wages and salaries, 5.0 percent was for purchases within the retail sector, and 5.2 percent was paid to communications and utility sectors. The remaining 8.5 percent of expenditures was distributed among seven other sectors of the local economy. No purchases were made from agricultural production or processing sectors. Payments made to local sectors represent the direct impact on regional gross business volume. To find the total impact of the direct expenditures respending cycles generated within the local economy, multipliers were applied to manufacturers' expenditures. Output from this analysis showed that the $2,025,225 in direct payments within the Jamestown Planning Region generated a total increase in gross business volume of $4,640,697 through the multiplier process. When related to the 389 employees required by the manufacturing firms, an increase in gross business volume of $11,930 per new job was experienced in the region.

## Employee Characteristics and Attitudes

Employee attributes and their attitudes toward work in manufacturing were measured through a personnel survey within the four Jamestown plants. Questionnaires were distributed to all 389 persons employed by the firms. Ninety-eight of these persons returned the mail-in questionnaires for a response rate of 25.2 percent. Noteworthy among personal characteristics revealed by the survey were the age distribution and education level of employees. Persons under 30 years old made up 63.3 percent of the sample, while only 19.4 percent were over 40 years old. Of those persons in the 19 to 29 year old distribution, 89.8 percent had completed high school, while 52.0 percent had one or more years of education beyond high school. Personnel of the firms was made up of 77.6 percent male and 22.4 percent female employees. Seventy-five percent of the employees were married, with an average number of children per family slightly less than one. Current residence of 93.9 percent of the work force was Jamestown. Nearly 37 percent

of the employees had moved to the city when accepting work in manufacturing. Only 6.2 percent of the personnel commuted daily from rural residences within the region.

Respondents were of a higly diverse occupational background, with only 4.1 percent having previous work experience in manufacturing. Despite the lack of experience, 56.1 percent of the employees felt their former skills were useful in their current job. Transfer of skills, plus job training given 51 percent of the workers, contributed to there being only 3.1 percent of the work force classed as common laborers, while 74.5 percent were classed as semiskilled. Sixty-two percent of the employees stated their level of skill and training was compatible with their current position within the firm; however, 36.7 percent felt they were capable of more advanced positions.

When asked for reasons that influenced their choice of a manufacturing job, 52 percent of the employees stated it was the best paying job available, 49 percent were influenced by the opportunity for advancement, and 36.8 percent stated it was the only work available. There were 21.1 percent of the male employees who expressed career interests in farming but had accepted manufacturing work when unable to start or continue a farming operation or were unable to find farm employment.

Accepting work in manufacturing resulted in an improved standard of living for 61.2 percent of all employees, the same living standards for 30 percent of the respondents, and a decline in standard of living for 9.2 percent of the personnel. The greatest proportion of persons who had improved their standard of living were those formerly employed in the transportation and service sectors.

While 91 percent of all respondents had improved or sustained their standard of living, there were indications that male employees felt a greater time discipline was now required by their manufacturing job. In comparing their current job to their former occupation, 42 percent of the male employees said they now had less vacation and recreation time, 34 percent felt the same amount of free time was available, while only 24 percent stated that manufacturing employment allowed more time away from their job. Forty-six percent of the male employees indicated they were now more regimented in the hours they must work, in their freedom to take time off, or in setting their own pace for completion of work. The employee evaluation of task discipline required in manufacturing employment showed contrasting results. Forty-two percent of the male employees stated they now enjoyed greater independence in carrying out their assigned role, 33 percent said they felt the same degree of independence as in their former occupation, while 25 percent indicated that manufacturing work placed them under greater work supervision.

## Conclusions

When the decision to locate a manufacturing plant has been narrowed to a major geographic region, subsidies, incentives, and community attitudes dominate other considerations in selection of the specific site. The importance of labor related factors as a determinant of industrial site selection suggests the presence of vocational or technical training facilities within an area may be a significant location incentive through increasing the productivity of the labor resource.

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A "catch-up" period may be necessary before the maximum employment or economic multiplier effect of industrialization is realized in lagging rural economies. Excess capacity in private and public sectors may partially absorb the increased demands of new industry, while the added demand for the labor resource may be supplied through a reduction in underemployment. This does not understate the importance of adding a new source of basic income to a local economy, but only recognizes that economic expansion sufficient to fully employ existing resources must come about before the maximum impact of industrialization is felt in all local sectors.

Industrial expansion in the Jamestown Planning Region is providing employment opportunities for the young and better educated workers. The result has been a reduction in outmigration of the mobile portion of the work force rather than supplementing long-term area residents or workers. The number of rural residents moving into Jamestown when employed in manufacturing, plus the number formerly associated with the agricultural sector, indicated manufacturing employment was more a vehicle out of farming rather than facilitating a career in farming. Objections to the time discipline required by manufacturing employment were overshadowed by the acceptance workers expressed for their job role, the higher standard of living provided most personnel, and the freedom of residence afforded 81 percent of the workers who objected to outmigration from North Dakota.

# APPENDIX

APPENDIX TABLE 1. EVALUATION OF JAMESTOWN LOCATION FACTORS BY FOUR FIRMS LOCATING AND FOUR FIRMS WHO CONSIDERED LOCATING IN JAMESTOWN, NORTH DAKOTA, 1972

| Location Factors | Evaluation of Location Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Strong Positive Influence By: | | Slight Positive Influence By: | | Not Considered By: | | Negative Influence By: | |
| | Locating Firms | Non-Locating Firms | Locating Firms | Non-Locating Firms | Locating Firms | Non-Locating Firms | Locating Firms | Non-Locating Firms |
| | (Number of Firms) | | | | | | | |
| Cooperation of Jamestown Businessmen | 3 | 3 | 1 | 1 | 0 | 0 | 0 | 0 |
| Industrial Promotion (info.) | 3 | 3 | 0 | 1 | 1 | 0 | 0 | 0 |
| Community Attitudes Toward Industry | 3 | 3 | 0 | 1 | 0 | 0 | 1 | 0 |
| Plant Rent or Construction Cost | 4 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| Building Site | 4 | 2 | 0 | 1 | 0 | 1 | 0 | 0 |
| Subsidies and Incentives | 3 | 3 | 0 | 1 | 1 | 0 | 0 | 0 |
| Waiver of Taxes | 3 | 3 | 0 | 1 | 1 | 0 | 0 | 0 |
| Building or Site Concessions | 3 | 2 | 0 | 2 | 1 | 0 | 0 | 0 |
| Capital Costs (plant and equipment) | 3 | 4 | 0 | 0 | 0 | 0 | 1 | 0 |
| Operating Capital (cost and supply) | 2 | 4 | 0 | 0 | 1 | 0 | 1 | 0 |
| Labor Costs | 2 | 1 | 2 | 3 | 0 | 0 | 0 | 0 |
| Willingness of Laborers | 3 | 2 | 1 | 0 | 0 | 1 | 0 | 1 |
| Labor Unions | 3 | 1 | 0 | 1 | 1 | 2 | 0 | 0 |
| Labor Relations | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 |
| Trainable Labor Supply | 2 | 1 | 1 | 3 | 0 | 0 | 1 | 0 |
| Labor Laws | 3 | 1 | 1 | 0 | 0 | 2 | 0 | 1 |
| Product Markets | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 0 |
| State and Local Taxes | 2 | 2 | 0 | 1 | 1 | 0 | 1 | 1 |
| Transportation Costs to Market | 2 | 0 | 1 | 2 | 1 | 2 | 0 | 0 |
| Transportation Facilities | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 |
| Transportation Costs of Raw Material | 1 | 1 | 0 | 2 | 2 | 0 | 1 | 1 |
| Living Conditions of Key Personnel | 0 | 3 | 1 | 1 | 3 | 0 | 0 | 0 |
| Worker's Happiness and Well-Being | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 1 |
| Recreational Facilities | 0 | 0 | 2 | 4 | 1 | 0 | 1 | 0 |
| Medical and Educational Facilities | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| Living Costs | 0 | 0 | 2 | 2 | 1 | 1 | 1 | 1 |
| Climate | 0 | 0 | 1 | 1 | 3 | 2 | 0 | 1 |
| Preference for Home State | 1 | 1 | 0 | 0 | 3 | 3 | 0 | 0 |
| Water Supply | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 0 |
| Fuel (costs and availability) | 1 | 1 | 1 | 0 | 2 | 2 | 0 | 1 |
| Electricity | 0 | 1 | 0 | 0 | 2 | 2 | 2 | 1 |
| Raw Material | 0 | 1 | 2 | 1 | 1 | 0 | 1 | 2 |
| Vocational Training Facilities | 0 | 0 | 1 | 2 | 3 | 1 | 0 | 1 |
| Abundance of Skilled Labor | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 |
| Availability of Contractors | 0 | 1 | 0 | 1 | 2 | 2 | 2 | 0 |
| Availability of Subcontractors | 0 | 1 | 0 | 0 | 2 | 2 | 2 | 1 |
| By-Products of Other Industries | 0 | 0 | 0 | 0 | 3 | 3 | 1 | 1 |

APPENDIX TABLE 2. PERSONAL CHARACTERISTICS OF JAMESTOWN MANUFACTURING EMPLOYEES, 1972

SEX:

| Male | Female |
|---|---|
| 77.6% | 22.4% |

AGE:

| 19-24 | 25-29 | 30-39 | 40-49 | 50-59 |
|---|---|---|---|---|
| 43.9% | 19.4% | 17.3% | 12.2% | 7.2% |

BIRTHPLACE:

| Jamestown | Rural Jamestown[a] | Rural N. Dak.[b] | Urban N. Dak.[c] | Midwest | Other |
|---|---|---|---|---|---|
| 31.6% | 12.2% | 26.5% | 8.2% | 6.1% | 15.3% |

MARITAL STATUS:

| Married | Single | Widowed | Divorced |
|---|---|---|---|
| 74.5% | 20.4% | 1.0% | 4.1% |

DEPENDENTS PER HOUSEHOLD:

| Avg. No. Children | Avg. No. Other Dependents (excludes spouse) |
|---|---|
| .9 | .04 |

EDUCATION:

| Grd. 1-8 | Grd. 9-11 | H. S. Grad. | Tech. S. Grad. | 1 Yr. Clg. | Jr. Clg. Grad. | 2-3 Yr. Clg. | Clg. Grad. | Post Grad. Study |
|---|---|---|---|---|---|---|---|---|
| 17.3% | 5.1% | 31.6% | 6.1% | 15.3% | 3.1% | 7.2% | 11.2% | 3.1% |

[a]Farms and towns less than 2,500 population in the Jamestown Planning Region.

[b]Farms and towns less than 2,500 outside the Jamestown Planning Region.

[c]North Dakota towns and cities over 2,500 other than Jamestown.

APPENDIX TABLE 3. EMPLOYEES' RESIDENCE, FORMER RESIDENCE, RESIDENCE PREFERENCE, AND COMMUTING PATTERNS OF JAMESTOWN MANUFACTURING EMPLOYEES, 1972

RESIDENCE:

| Own Home in Jamestown | Rent Home in Jamestown | Own Home in Sml. Town | Own Home on Farm | With Parents |
|---|---|---|---|---|
| 45.9% | 44.9% | 3.1% | 3.1% | 3.1% |

RESIDENCE CHANGE TO ACCEPT MANUFACTURING WORK:

| Change in Residence | No Change in Residence |
|---|---|
| 36.7% | 63.3% |

FORMER RESIDENCE: (of persons moving to accept job with manufacturing firms)

| Farm Near Jamestown | Small Town Near Jamst.[a] | Farm Outside Jamst. Region | Sml. Town N. Dak.[b] | Urban N. Dak.[c] | Urban U. S.[d] |
|---|---|---|---|---|---|
| 8.3% | 8.3% | 2.8% | 33.3% | 16.7% | 30.6% |

RESIDENCE PREFERENCE:

| Farm | Small Town in N. Dak. | City in N. Dak. | Small Town Outside N. Dak. | City Outside N. Dak. |
|---|---|---|---|---|
| 21.4% | 12.2% | 46.9% | 7.1% | 12.2% |

EMPLOYEE ACCEPTANCE OF BETTER PAYING JOB IF MOVE TO LARGE CITY IS REQUIRED:

| Would Accept Job | Would Not Accept Job |
|---|---|
| 52.0% | 48.0% |

COMMUTING TIME AND DISTANCE:

| Average Number of Minutes | Average Number of Miles |
|---|---|
| 10.9 | 3.2 |

[a]Small towns in the Jamestown Planning Region under 2,500 population.

[b]North Dakota towns under 2,500 population outside the Jamestown Planning Region.

[c]North Dakota towns and cities over 2,500 population other than Jamestown.

[d]Towns and cities having greater than 2,500 population outside North Dakota.

APPENDIX TABLE 4. FORMER OCCUPATION, SKILLS, TRAINING, AND CURRENT POSITION OF JAMESTOWN MANUFACTURING EMPLOYEES, 1972

FORMER OCCUPATION:

| Farm Operators | Farm Laborer | Const. Work | Transportation | Service Sector | Retail | Manufacturing | Mgt. or Technician | Other |
|---|---|---|---|---|---|---|---|---|
| 10.2% | 9.2% | 8.2% | 10.2% | 27.6% | 4.1% | 4.1% | 11.2% | 15.3% |

DURATION OF FORMER OCCUPATION:

| Average Number of Years |
|---|
| 7.1 |

TRANSFER OF SKILLS:

| Former Skills Are Useful in Mfg. Work | Former Skills Not Useful |
|---|---|
| 56.1% | 43.9% |

PROPORTION OF EMPLOYEES INITIALLY GIVEN JOB TRAINING:

| Job Training | No Job Training |
|---|---|
| 51.0% | 49.0% |

PROPORTION OF TRAINEES GIVEN WAGE INCREASE AFTER JOB TRAINING:

| Wage Increase | No Wage Increase |
|---|---|
| 90.0% | 10.0% |

CURRENT POSITION HELD WITH FIRM:

| Laborer | Semiskilled Labor | Skilled Labor | Management |
|---|---|---|---|
| 3.1% | 74.5% | 3.1% | 19.4% |

EMPLOYEE OUTLOOK TOWARD CURRENT MANUFACTURING JOB:

| Job is Considered a Permanent Career | Job is Not Considered Permanent |
|---|---|
| 43.9% | 56.1% |

APPENDIX TABLE 5. AVERAGE SALARY OF MANUFACTURING EMPLOYEES, OCCUPATION AND SALARY OF SPOUSE, AND INCOME TO HOUSEHOLDS OF MANUFACTURING EMPLOYEES, 1972

AVERAGE SALARY OF MANUFACTURING EMPLOYEES:[a]

| Average of Employees' Salaries | Male Only | Female Only |
|---|---|---|
| $6,500 to $7,000 | $7,500 to $8,000 | $4,000 to $4,500 |

PROPORTION OF SPOUSES EMPLOYED:

| Wife Wkg. Part-Time | Wife Wkg. Full-Time | Wife Does Not Work | Husb. Wkg. Full-Time | Husb. or Wife Wkg. Part- or Full-Time |
|---|---|---|---|---|
| 14.6% | 39.5% | 46.0% | 91.7% | 57.1% |

OCCUPATION--WIVES OF MANUFACTURING EMPLOYEES (30 persons):

| Service Sector | Retail | Management | Technician |
|---|---|---|---|
| 80.8% | 13.6% | 2.8% | 2.8% |

OCCUPATION--HUSBANDS OF MANUFACTURING EMPLOYEES (12 persons):

| Service Sector | Retail | Manufacturing | Trans-portation | Management | Technician |
|---|---|---|---|---|---|
| 36.4% | 18.2% | 18.2% | 9.1% | 9.1% | 9.1% |

AVERAGE SALARY RANGE OF MANUFACTURING EMPLOYEE'S SPOUSE:

| Average Salary Range of Wives Working Part-Time or Full-Time | Average Salary Range of Wives Working Full-Time | Average Salary Range of Husbands Working Full-Time |
|---|---|---|
| $3,500 to $4,000 | $4,000 to $4,500 | $8,500 to $9,000 |

AVERAGE INCOME RANGE OF MANUFACTURING EMPLOYEE HOUSEHOLDS:

| Households in Which Husb. and Wife Work | Households of All Married Couples | Households of Single Males | Households of Single Females | Households of Manufacturing Employees |
|---|---|---|---|---|
| $11,000 to $12,000 | $9,500 to $10,500[b] | $6,500 to $7,000 | $4,500 to $5,000 | $8,500 to $9,000[c] |

[a]All manufacturing employees worked full-time throughout the year.

[b]Assumes no working children.

[c]Added income from second job (4 persons), operation of small business (1 person), and farming interests (4 persons) did not alter average income.